REGISTRATION REPORT

Part B

Section 7

Metabolism and Residues

Detailed summary of the risk assessment

Product code: GLOB1310aH

Product name(s): Glosset Ace

Chemical active substances:

Aclonifen, 540 g/L
Flufenacet, 60 g/L

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

(authorization)

Applicant: Globachem NV

Submission date: December 2021

MS Finalisation date: 25/08/2022

After commenting: 14/12/2022

Version history

When	What
December 2021	Initial submission by the applicant for approval of new product.
August 2022	First zRMS PL evaluation
December 2022	Corrections made by zRMS PL after commenting round

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7 Metabolism and residue data (KCA section 6)

7.1 Summary and zRMS Conclusion

zRMS comments:

This application was submitted by Globachem NV for approval of Glosset Ace (GLOB1310aH) containing 540 g/L Aclonifen and 60 g/L of Flufenacet formulated as a suspension concentrate (SC) for pre-emergence and early post-emergence treatment on winter cereals.
This application follows the data requirements for the active substance laid down in Regulation (EC) No. 544/2011 and the data requirements for the plant protection product laid down in Regulation (EC) No. 284/2013.This Part B document only reviews data and additional information that has not previously been considered within the EU review process.
Since this document is based on the information provided by the applicant, all review comments, additions and corrections have been made using commenting boxes or highlighted in grey. Any incorrect data or text not evaluated by the zRMS has been crossed out.

7.1.1 Critical GAP(s) and overall conclusion

Selection of critical uses and justification

The critical GAPs with respect to consumer intake and risk assessment for the preparation GLOB1310aH are presented in Table 7.7-1. They have been selected from the individual GAPs in the NEU for winter cereals. A list of all intended uses within the NEU is given in Part B, Section 0.

Overall conclusion

State whether or not the available data are sufficient for evaluation, if a risk for consumers has been detected for any European Member State and if a new MRL is required prior to authorization. Data gaps and conditions for registration should be listed (if appropriate).

The data available are considered sufficient for risk assessment. An exceedance of the current MRLs for cereals for aclonifen and flufenacet as laid down in Reg. (EU) 396/2005 is not expected.
The chronic and the short-term intakes of aclonifen and flufenacet residues are unlikely to present a public health concern.
As far as consumer health protection is concerned, Poland as zRMS agrees with the authorization of the intended use(s).

According to available data, no specific mitigation measures should apply.

Data gaps

No data gaps have been noticed.

Table 7.7-1: Acceptability of critical GAPs (and respective fall-back GAPs, if applicable)

1	2	3	4	5	6	7		8				9			10	11
GAP number (see part B.0)*	**Crop and/ or situation ****	**Zone**	**Product code**	**F, Fn, Fpn G, Gn, Gpn or I*****	**Pests or Group of pests controlled**	**Formulation**		**Application**				**Application rate per treatment**			**PHI (days)**	**Conclusion**
						Type	**Conc. of as**	**method kind**	**growth stage & season**	**number min max**	**interval between applications (min)**	**kg as/hL min max**	**water L/ha min max**	**kg as/ha min max**		
1-6	Winter wheat (0500090) (TRZAW), Winter barley (0500010) (HORVW), Winter rye (0500070) (SECCW), Triticale (0500990) (TTLWI) Winter oat (0500050) (AVESW)	Central	GLOB1310aH	F	Annual weeds (BBBBB)	SC	Aclonifen 540g/L Flufenacet 60g/L	Downward spraying	BBCH 00-09 (Sep-Dec)	1	-	Aclonifen: 0.27-0.54 Flufenacet: 0.03-0.06	150-300	Aclonifen: 0.81 kg Flufenacet: 0.09 kg	NR	A
7-12	Winter wheat (0500090) (TRZAW), Winter barley (0500010) (HORVW), Winter rye (0500070) (SECCW), Triticale (0500990) (TTLWI) Winter oat (0500050) (AVESW)	Central	GLOB1310aH	F	Annual weeds (BBBBB) Blackgrass (ALOMY)	SC	Aclonifen 540g/L Flufenacet 60g/L	Downward spraying	BBCH 00-09 (Sep-Dec)	1	-	Aclonifen: 0.36-0.54 Flufenacet: 0.04-0.06	200-300	Aclonifen: 1.08 kg Flufenacet: 0.120 kg	NR	A

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1

** Use also code numbers according to Annex I of Regulation (EU) No 396/2005
*** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

Explanation for Column 11 “Conclusion”

A	Exposure acceptable without risk mitigation measures, safe use
R	Further refinement and/or risk mitigation measures required
N	Exposure not acceptable, no safe use

7.1.2 Summary of the evaluation

The preparation GLOB1310aH is composed of aclonifen and flufenacet.

Table 7.1-2: Toxicological reference values for the dietary risk assessment of aclonifen and flufenacet

Reference value	Source	Year	Value	Study relied upon	Safety factor
Aclonifen					
ADI	EFSA Scientific Report	2008	0.07 mg/kg bw/day	2-year rat study	100
ARfD	EFSA Scientific Report	2008	Not necessary	-	-
Flufenacet					
ADI	Review Report 7469/VI/98 Final	2003	0.005 mg/kg bw/day	2-year rat study	250
ARfD	Review Report 7469/VI/98 Final	2003	0.017 mg/kg bw/day	90 day, 1 year dog study	100

7.1.2.1 Summary for Aclonifen

Table 7.1-3: Summary for Aclonifen

Use-No.*	Crop	Plant metabolism covered?	Sufficient residue trials?	PHI sufficiently supported?	Sample storage covered by stability data?	MRL compliance	Chronic risk for consumers identified?	Acute risk for consumers identified?
1-4	Winter wheat, winter barley, winter rye, triticale Winter oat	Yes	Yes	Yes**	Yes	Yes	No	N.a.***

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1
** PHI is covered by the vegetation period of the crop
*** not applicable as no ARfD was necessary

As residues of aclonifen do not exceed the trigger values defined in Reg. (EU) No 283/2013, there is no need to investigate the effect of industrial and/or household processing.

Residues in succeeding crops have been sufficiently investigated taking into account the specific circum-

stances of the cGAP uses being considered here. It is very unlikely that residues will be present in succeeding crops.
Considering dietary burden and based on the intended uses, no significant modification of the intake was calculated for livestock. Further investigation of residues as well as the modification of MRLs in commodities of animal origin is therefore not necessary.

7.1.2.2 Summary for Flufenacet

Table 7.1-4: Summary for Flufenacet

Use-No.*	Crop	Plant metabolism covered?	Sufficient residue trials?	PHI sufficiently supported?	Sample storage covered by stability data?	MRL compliance	Chronic risk for consumers identified?	Acute risk for consumers identified?
1-4	Winter wheat, winter barley, winter rye, triticale Winter oat	Yes	Yes	Yes**	Yes	Yes	No	No

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1
** PHI is covered by the vegetation period od the crop
*** not applicable as no ARfD was necessary

As residues of flufenacet do not exceed the trigger values defined in Reg (EU) No 283/2013, there is no need to investigate the effect of industrial and/or household processing.

Residues in succeeding crops have been sufficiently investigated taking into account the specific circumstances of the cGAP uses being considered here. It is very unlikely that residues will be present in succeeding crops.

Considering dietary burden and based on the intended uses, no significant modification of the intake was calculated for livestock. Further investigation of residues as well as the modification of MRLs in commodities of animal origin is therefore not necessary.

7.1.2.3 Summary for GLOB1310aH

Table 7.1-5: Information on GLOB1310aH (KCA 6.8)

Crop	PHI for GLOB1310aH proposed by applicant	PHI/ Withholding period* sufficiently supported for		PHI for GLOB1310aH proposed by zRMS	zRMS Comments (if different PHI proposed)
		Aclonifen	Flufenacet		
Winter wheat, winter barley, winter rye,	n.a.**	Yes	Yes		Not specified

Crop	PHI for GLOB1310aH proposed by applicant	PHI/ Withholding period* sufficiently supported for		PHI for GLOB1310aH proposed by zRMS	zRMS Comments (if different PHI proposed)
		Aclonifen	Flufenacet		
triticale					

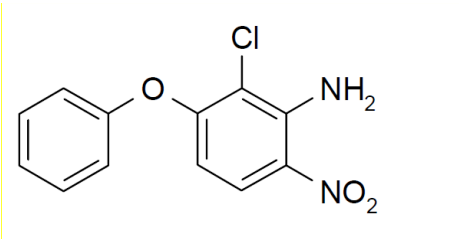
NR: not relevant
* Purpose of withholding period to be specified
** pre-emergence. The PHI is defined by the growth stage at treatment (time elapsing between last treatment and harvest of the crop)

Assessment

7.2 Aclonifen

General data on Aclonifen are summarized in the table below (last updated 2021/06/25)

Table 7.2-1: General information on Aclonifen

Active substance (ISO Common Name)	Aclonifen
IUPAC	2-chloro-6-nitro-3-phenoxyaniline
Chemical structure	
Molecular formula	$C_{12}H_9ClN_2O_3$
Molar mass	264.7 g/mol
Chemical group	Diphenyl ether
Mode of action (if available)	Inhibition of carotenoid biosynthesis
Systemic	Yes
Company (ies)	Bayer CropScience *
Rapporteur Member State (RMS)	NL
Approval status	Approved 01/08/2009 COMMISSION DIRECTIVE 2008/116/EC REGULATION (EU) No 540/2011
Restriction	Only uses as herbicide may be authorised.
Review Report	SANCO/161/08 – rev. 1 27/11/2009
Current MRL regulation	Reg. (EU) 2021/1531
Peer review of MRLs according to Article 12 of Reg. No 396/2005 EC performed	Yes
EFSA Journal : Conclusion on the peer review	Yes EFSA Scientific Report (2008) 149, 1-80**

EFSA Journal: conclusion on article 12	Yes EFSA Journal 2015; 13(11): 4323.
Current MRL applications on intended uses	~~Cereals~~ None ~~(0.01 mg/kg)~~

* Notifier in the EU process to whom the a.s. belong(s)
** If yes: EFSA, YYY

7.2.1 Stability of Residues (KCA 6.1)

7.2.1.1 Stability of residues during storage of samples

Available data

Stability of Aclonifen residues when stored deep frozen was assessed in several crop matrices during the EU review of Aclonifen. As these data are out of protection, the applicant refers to these data for the registration of GLOB1310aH.

Storage stability for aclonifen was investigated in the framework of the peer review (DAR, Germany, 2006). In EFSA 2008 it was concluded: *"Storage stability for aclonifen was investigated in the framework of the peer review (Germany, 2006). Aclonifen was stable at -18°C for a period of 24 months in high water content (tomatoes, potatoes and fresh peas) and in high oil content commodities (sunflower seeds) and for a period of 12 months in dry commodities (maize grain)."*

The results of these studies are summarised in the table below.

Table 7.2-2: Summary of stability data achieved at ≤ - 18°C (unless stated otherwise)

Matrix	Characteristics of the matrix	Acceptable Maximum Storage duration	Reference
Data relied on in EU			
Plant products			
Potato	High starch content	12 months	EFSA, 2008
Maize grain	High starch content, dry	12 months	
Maize plant	High water content	12 months	
Tomatoes	High water content	24 months	
Dry Pea, seed	High protein content, dry	24 months	
Sunflower seed	High oil content	24 months	

Conclusion on stability of residues during storage

It was demonstrated that aclonifen residues were stable when stored at temperatures of -18°C or below. Stability was investigated for at least 24 months in sunflower seeds, pea and tomato and for at least 12 months in maize grain, maize forage and potato. Data are sufficient to cover the trials on winter wheat supporting intended GAP of GLOB1310aH.

Comments of zRMS	The zRMS agrees with the conclusions provided by the applicant regarding storage stability of aclonifen. Since cereals belong to the dry commodities, the storage stability is adequately demonstrated for the commodities under assessment.

7.2.1.2 Stability of residues in sample extracts (KCA 6.1)

Available data:

Relevant information on the stability of aclonifen residues in the final extracts was investigated during development of method 00950 reported in the Annex II dossier (DAR, 2006). The extracts have shown to be stable over a period of 14-40 days.

Based on Evaluation of confirmatory data following the Article 12 MRL review for aclonifen (EFSA, 2020):

"*In order to address the data gap number 1,5 the applicant provided validation data for a multiresidue-method for the determination of aclonifen residues in matrices with high oil content (sunflower seed), high water content (tomato fruit), high acid content (orange fruit), high starch/protein content (wheat grain) as well as in powdered caraway seed (a complex matrix/no group matrix, representative of spices for which confirmatory data were requested) (Netherlands, 2019).*

During the method validation, aclonifen was found to be stable in final extracts of tomato (fruit), sunflower seed (not hulled), wheat (grain), orange (fruit) and caraway (powdered seed) for at least 23 days, with mean recoveries within the range of 70–110% for all matrices (EFSA, 2020).

Applicant's data:

For analysis of aclonifen the maximum storage interval of final sample extracts at typically 1 °C to 10 °C from extraction until injection to LC-MS/MS was 15 days for leaves, 3 days for grain and 3 days for straw. The stability of the analyte in the final extracts of wheat (grain and straw) upon storage at typically 1 °C to 10 °C for at least 21 days was demonstrated in study S20-07421(filed in Part B5 within this dossier as KCP 5.2-01). For clarity sake a summary is included in Appendix 2.

7.2.2 Nature of residues in plants, livestock and processed commodities

7.2.2.1 Nature of residue in primary crops (KCA 6.2.1)

Available data

The metabolism of aclonifen in primary crops (root crops, cereals/grass and pulses/oilseeds) has been investigated in the framework of EU pesticides peer review and the MRL review (EFSA, 2008, 2015). No new data are submitted in the framework of this application. The data evaluated during the EU Review of Aclonifen are out of protection and are sufficient to describe the behaviour of the formulated product, so no further studies are required. Ether cleavage is only a very minor pathway in the plant metabolism of Aclonifen and, consequently, metabolism studies with [^{14}C-phenyl]-labelled Aclonifen were not required.

Table 7.2-3: Summary of plant metabolism studies

Crop Group	Crop	Label position	Application and sampling details					Reference
			Method, F or G (a)	Rate (kg a.s./ha)	No	Sampling (DAT)	Remarks	
EU data								
Root and tuber vegetables	Potato	U-^{14}C-aniline	Post-emergence,	2.5 kg a.s./ha	1	93		DAR (DE), 2006

			F (pots), soil application Post-emergence, F (pots), foliar application	 1.5 kg a.s./ha	 1	 42		EFSA, 2008
Cereals	Wheat		Pre-emergence, G Post-emergence, G	3.248 kg a.s./ha 0.303 kg a.s./ha	1 1	54, 76, 152 (field rate) 22, 41, 138 (field rate) 138 (exaggerated field rate)		
Pulses and oilseeds	Peas		Pre-emergence, G Post-emergence, G	2.97 kg a.s./ha 0.394 kg a.s./ha	1 1	70, 78, 108 (field rate) 42, 57, 93 (field rate) 93 (exaggerated field rate)		

Summary of plant metabolism studies reported in the EU

Following soil application of [^{14}C]-Aclonifen at 2.5 kg a.s./ha, three quarters of recovered radioactivity were found in the non-edible potato tops. Translocation of Aclonifen and/or its degradation products was mainly acropetal. The higher amount of radioactivity in peel compared to pulp and the presence of Aclonifen in peel but not in pulp suggested that uptake into tubers occurred via the peel which was in contact with the treated soil. The main residue in peel was Aclonifen. The remaining part of the extractable residue in peel as well as in pulp was distributed among numerous unknown polar compounds in low individual amounts. In all plant parts, about half of the total radioactivity was bound to the plant material and was not extractable. After foliar application, > 99 % of the applied radioactivity remained associated with the potato tops indicating only a very low tendency to translocate basipetally. Foliar application resulted in higher tuber residues than soil application, although using a lower application rate. Residues were only characterised in potato tops. Aclonifen and three metabolites representing mono-hydroxylated Aclonifen derivatives were identified in individual amounts ranging from 2.8 to 7.5 % TRR. The residue consisted mainly of polar compounds in very low individual amounts, with 34 % of the residue remaining unextractable.

The residue levels in wheat plants following pre-emergence application of [^{14}C]-Aclonifen at 3.25 kg/ha were low in all samples. TRR in forage wheat ranged from 0.035 to 0.094 mg a.s.-eq./kg, was 0.037 mg a.s.-eq./kg at harvest and amounted to 0.374 mg a.s.-eq./kg in straw + chaff. The composition of the residue was found to comprise parent compound plus small amounts of the metabolites RPA 407291 and RPA 407288 (less than 10 % TRR each) and RPA 508285 (> 10 % according to HPLC analyses) plus a number of unidentified compounds that were polar in nature. The unextractable portion of the residue represented less than 20 % TRR except with grain (43 %). The significant differences between HPLC and

TLC are probably due to matrix effects. The residue level in wheat grain following post-emergence application of Aclonifen at 303 g/ha was extremely low (0.008 mg/kg) and unextractable. In forage wheat and straw + chaff TRR ranged from 1.457 to 2.466 mg a.s.-eq./kg. This residue was nearly completely extractable and consisted mainly of Aclonifen with only negligible amounts of metabolites.

Following pre-emergence treatment with [^{14}C]-Aclonifen at 2.97 kg a.s./ha the total radioactive residues in human-edible parts of pea plants at all the commercial harvest growth stages (mangetout, fresh peas, dry peas) were found to be at low levels ranging from 0.005 to 0.055 mg a.s.-eq./lg. The major part of the residue in peas was unextractable. Detailed characterisation of the residue was only performed with the vining and pod samples bearing higher residues. Total residues in the vinings ranged from 0.318 to 2.928 mg a.s.-eq./kg and in the pods from 0.005 to 0.209 mg a.s.-eq./kg, > 80 % of which was extractable. The major compound in the extractable residue was always parent compound (42-81 % TRR), accompanied by low amounts of RPA 508285 and RPA 407074 (6-7 % TRR each). Following post-emergence treatment at 394 g a.s./ha the residues in human-edible parts of pea plants were lower than those found after pre-emergence treatment. The levels in vinings were, however, considerably higher and were almost entirely composed of parent compound Aclonifen. The only relevant residue in pea was Aclonifen.

The intended use on winter cereal at pre-emergence (BBCH 00-09) treated with 0.810 or 1.08 kg/ha of aclonifen, is considered wholly supported by the metabolism study conducted on spring wheat available in the DAR 2006 and conducted at 3.25 kg/ha at pre-emergence. The application timing is equivalent and the application rate in the metabolism study is much higher than the proposed GAP rate, so the metabolism study is more critical than the pre-emergence use.

Conclusion on metabolism in primary crops

It can be concluded that the intended uses on winter cereal are sufficiently supported by the available metabolism data, and no further cereal metabolism studies are required to support the intended uses of GLOB1310aH.

Summary of new plant metabolism studies

No new plant metabolism studies are submitted.

Comments of zRMS	The metabolism of aclonifen was investigated for pre- and post-emergence applications in roots and tuber vegetables (potatoes), cereals (wheat) and pulses and oilseeds (peas) (Germany, 2006). The potential me-tabolites arising from the phenyl ring are phenol and hydroquinone which are considered naturally occur-ring in plants. Moreover, ether cleavage is considered only as a very minor pathway in the plant metabolism of aclonifen. Consequently, the EU pesticides peer review concluded that additional metabolism studies with phenyl-labelled aclonifen were not required. From the available metabolism studies, aclonifen was found to be the main residue. (EFSA, 2008).

7.2.2.2 Nature of residue in rotational crops (KCA 6.6.1)

Available data

During the EU review (EFSA, 2008), a confined rotational crop study with spinach, barley and carrot was evaluated. The meeting of experts PRAPeR concluded that no significant residues would occur in all crop groups except root and tuber crops. It was concluded that positive residues of Aclonifen could occur in rotational root and tuber crops. It was proposed that there could be a restriction not to plant root and tuber crops after application of Aclonifen but no clear plant back interval was proposed. The meeting conclud-

ed that such a restriction was not possible and agreed that there should be a data gap for a rotational crop residue study with focus on root and tuber vegetables.

Table 7.2-4: Summary of metabolism studies in rotational crops

Crop group	Crop	Label position	Application and sampling details					Reference
			Method, F or G *	Rate (kg a.s./ha)	Sowing intervals (DAT)	Harvest Intervals (DAT)	Remarks	
EU data								
Leafy vegetables	Spinach	[aniline-UL-^{14}C] aclonifen	F	3.72	29; 120; 365	43, 46, 54, 61, 97, 146, 201, 350, 384, 397, 418	Bare soil application	DAR, GERMANY, 2006; EFSA, 2008; EFSA, 2015
Root and tuber vegetables	Carrot					75, 89, 118, 350, 459, 490		
Cereals	Barley					69, 118, 124, 194, 424, 431, 483		

Two rotational crop residue studies performed in root and tuber vegetables (turnip) were submitted by the notifier after the Annex I inclusion as confirmatory data. These studies were evaluated in the German review report of 2011. The two studies demonstrate that no residues are to be expected in root and tuber vegetables subsequent to treatment of antecedent crops. More information about these studies is given below. As these studies are confirmatory data, no data protection is valid for these studies (SANCO/12576/2012) and they can be used to support the intended use of GLOB1310aH cereals. No new data are submitted in the framework of this application.

Table 7.2-5: Summary of metabolism studies in rotational crops (confirmatory data)

Crop group	Crop	Label position	Application and sampling details					Reference
			Method, F or G *	Rate (kg a.s./ha)	Sowing intervals (DAT)	Harvest Intervals (DAT)	Remarks	
EU data								
Root and tuber vegetables	Turnip	Unknown	Soil (F)	2.4 kg a.s./ha	30 and 60	Commercial harvest (BBCH 47-49)	Storage intervals between 89 and 202 days	Addendum 4 to DAR, 2011

* Outdoor/field application (F) or glasshouse/protected/indoor application (G)

Summary of plant metabolism studies reported in the EU

Carrot, spinach and barley were planted at various times (29, 120, and 365 days) after the application of [aniline U 14C] aclonifen to bare soil at a rate of 3.72 kg a.s./ha, more than four times the maximum intended rate of the compound. The total radioactive residues (TRR) determined in the mature crops from the successive plantings indicate a limited uptake of residues in the roots from root crops and in cereal straw, which decreased from the 29 day planting to the two next plantings. Thus, the total radioactive residues in carrot roots taken at mature harvest from the 29 day, 120 day and 365 day plantings amounted to 0.49 mg/kg, 0.20 mg/kg and 0.04 mg/kg, respectively. The total radioactive residues in barley straw from the 29 day, 120 day and 365 day plantings amounted to 0.25 mg/kg, 0.04 mg/kg and 0.08 mg/kg respectively. The residue uptake was comparatively lower in foliage from root crops (maximum total radioactive residues of 0.09 mg/kg), and extremely low in leafy vegetables and cereal grain.

Parent aclonifen was the major residue component in carrot root throughout the study, accounting for 80.5%, 68.3%, and 57.7% of the TRR in harvest samples from the 29, 120 and 365 day plantings, respectively. The spinach extracts from the 29 day planting mature harvest samples were found to contain aclonifen, which accounted for 10.7% of the TRR and a second residue component, which accounted for up to 9.5% of the TRR. In barley straw from the 29 day planting about 33% of the total radioactive residues were extractable by solvents. The extract was found to comprise six radioactive components each accounting for less than 10% of the TRR. Two of them were identified as aclonifen (3.0% of the TRR) and AE 0561852 (RPA 508285, 2.3% of the TRR).

As stated in EFSA Journal 2015;13(11): 4323:

"All crops under consideration may be grown in rotation. According to the soil degradation studies evaluated in the framework of the peer review, the period required for 90 percent dissipation (DT90) of aclonifen ranges between 104 and 649 days, which is higher than the trigger value of 100 days (EFSA, 2008). According to the European guidelines on rotational crops (European Commission, 1997c), further investigation of residues in rotational crops is relevant.
A confined rotational crop study conducted with spinach, carrot and barley planted 30, 120 and 360 days after application of aniline-labeled aclonifen at 3.72 kg a.s./ha (1.4N) on bare soil was evaluated during the peer review (Germany, 2006; EFSA, 2008).
Total radioactive residues (TRRs) in carrot foliage, spinach, immature barley, barley grain and barley chaff remained below 0.1 mg/kg. At 30 DAT (days after treatment), TRR in carrot root reached a maximum of 0.49 mg a.s. eq/kg, decreasing to 0.20 mg a.s. eq/kg at 120 DAT and to 0.035 mg a.s. eq/kg at 360 DAT. Residues in barley straw amounted to 0.245 mg a.s. eq/kg at 30 DAT, decreasing to 0.04 and 0.08 mg a.s. eq/kg at 120 and 360 DAT, respectively. The extractable residue in carrot root consisted exclusively of aclonifen which was also the only major component in carrot foliage and the only identifiable compound in spinach. Barley grain contained one major polar component in a low absolute amount (0.004 mg/kg). Barley straw comprised aclonifen and a minor metabolite."

Summary of new plant metabolism studies

No new studies are submitted with this submission.

Conclusion on metabolism in rotational crops

The metabolism of aclonifen in primary and rotational crops was found to be similar and a specific residue definition for rotational crops is not deemed necessary. The residue definition for risk assessment and monitoring can remain as parent aclonifen only.

The rotational crop metabolism study showed that uptake of radioactive residues was not pronounced for leafy and cereal crops but significant residues were found in carrots grown as a rotational crop.

Comments of zRMS	A confined rotational crop study conducted with spinach, carrot and barley planted 30, 120 and 360 days after application of aniline-labeled aclonifen at 3.72 kg as/ha on bare soil was evaluated during the peer review (Germany, 2006; EFSA, 2008). The rotational crop metabolism study showed that in the majority of crops no significant residues would occur. However, for root and tuber crops it showed that residues could be expected.

7.2.2.3 Nature of residues in processed commodities (KCA 6.5.1)

Available data

As residues of Aclonifen exceeding 0.1 mg/kg are not expected in the treated crops and considering that the chronic exposure does not exceed 10% of the ADI there is no need to investigate the effect of industrial and/or household processing.

Nevertheless, eleven supervised field trials analysing residues in sunflower seed raw and processed to oil and press cake are available. However, since residues in raw and processed samples were always < LOQ, processing factors could not be derived (EFSA, 2008). The studies are considered as additional information only and additional studies are not required.

No new data submitted within this application.

7.2.2.4 Conclusion on the nature of residues in commodities of plant origin (KCA 6.7.1)

Table 7.2-6: Summary of the nature of residues in commodities of plant origin

Endpoints	
Plant groups covered	Root and tuber vegetables (potatoes), cereals (wheat) and pulses and oilseeds (peas)
Rotational crops covered	Leafy crops (spinach), cereals (barley), root and tuber vegetables (carrot, turnip)
Metabolism in rotational crops similar to metabolism in primary crops?	Yes
Processed commodities	No processing studies required
Residue pattern in processed commodities similar to pattern in raw commodities?	/
Plant residue definition for monitoring	Aclonifen (EFSA, 2008)
Plant residue definition for risk assessment	Aclonifen (EFSA, 2008)
Conversion factor from enforcement to RA	Not applicable (EFSA, 2008)

7.2.2.5 Nature of residues in livestock (KCA 6.2.2-6.2.5)

Available data

No new data submitted in the framework of this application. The data evaluated during the EU Review of Aclonifen are out of protection and are sufficient to describe the behaviour of the formulated product, so

no further studies are required. During the EU review, the metabolism of Aclonifen was investigated in lactating goats. The study is summarised in Table 7.2-6 below.

Table 7.2-7: Summary of animal metabolism studies

Group	Species	Label position	No of animal	Application details		Sample details		Reference
				Rate (mg/kg bw/d)	Duration (days)	Commodity	Time of sampling	
EU data								
Lactating ruminants	Goat	U-^{14}C-aniline	3	2 x 0.036 (low dose) 2 x 0.34 (medium dose) 2 x 2.76 (high dose)	7 7 5	Milk Urine and faeces **Tissues**	twice daily daily at sacrifice	DAR (Germany), 2006 EFSA, 2008

Summary of plant metabolism studies reported in the EU

Lactating goats were twice a day dosed orally with Aclonifen at three different dose levels (1.2, 15.9 and 100.7 mg a.s./kg feed, corresponding to 0.036, 0.34 and 2.76 mg/kg bw) for 7 (low and medium dose) or 5 (high dose) consecutive days. The majority of the administered radioactivity (74-77 %) was excreted via urine and faeces. Residues in milk were low throughout the dosing period and mainly comprised of Aclonifen and a couple of polar metabolites. A plateau concentration was reached by day 4. Residues in meat and fat were below the LOQ in the low and medium dose group and were not analysed in the high dose group. Residues in liver and kidney increased along with the administered dose. The main metabolite in kidney was RPA 407074-methylimidazole together with one polar metabolite fraction, while Aclonifen did not occur in the kidney. One third of the residue occurring in liver was attributed to Aclonifen while the rest was distributed among at least 3 polar and unknown metabolites.

Summary of new animal metabolism studies

No new studies submitted within this application.

Conclusion on metabolism in livestock

Even the lowest dose was significantly higher than the calculated dietary burden for livestock (0.095 mg/kg diet for beef cattle and pig). Therefore, results from the low dose group (corresponding to 1.2 mg a.s./kg feed) are considered the most suitable to support the intended use of GLOB1907bH SC in potatoes. In milk from this dose group, TRR was clearly below 0.01 mg/kg. Also, residues in meat, fat and kidney were clearly below 0.01 mg/kg. Of the edible tissues taken at necropsy, only the liver contained levels of radioactivity above the LOQ (0.026 mg/kg). However, neither Aclonifen nor one of the metabolites individually exceeded 0.01 mg/kg in the liver.

The metabolism of Aclonifen in the goat involves a combination of hydroxylation on the phenyl ring, N-acetylation of the amine and reduction of the nitro group. The dehydration of metabolites where the amine was N-acetylated and where the nitro group had been reduced, led to the formation of methylimidazole derivatives. No cleavage of the diphenyl ether bond was observed. The general metabolic pathways in ruminants and rats were considered comparable (France, 2015).

Based on these findings, it is proposed to define the residue for monitoring and risk assessment in commodities of animal origin as parent Aclonifen only. This residue definition is fat soluble (log Pow 4.37). An analytical method using HPLC-MS/MS was fully validated for enforcement of the proposed residue

definition with an LOQ of 0.01 mg/kg in muscle, fat, liver, kidney, milk and eggs (France, 2015).

7.2.2.6 Conclusion on the nature of residues in commodities of animal origin (KCA 6.7.1)

Table 7.2-8: Summary on the nature of residues in commodities of animal origin

	Endpoints
Animals covered	Not triggered for the representative uses. Note: a lactating goat study was supplied (see above).
Time needed to reach a plateau concentration	4 (EFSA, 2015)
Animal residue definition for monitoring	Aclonifen (EFSA Journal, 2015)
Animal residue definition for risk assessment	Aclonifen (EFSA Journal, 2015)
Conversion factor	Not applicable (EFSA Journal, 2015)
Metabolism in rat and ruminant similar	Yes (EFSA Journal, 2015)
Fat soluble residue	Yes (EFSA Journal, 2015)

Comments of zRMS	It is proposed to define the residues definition for monitoring and risk assessment in commodities of plant and animal origin as parent aclonifen.

7.2.3 Magnitude of residues in plants (KCA 6.3)

The use patterns for GLOB1310aH involve autumn uses (pre-emergence) at applications rates up to 2.0 L/ha (corresponding to 1080 g of Aclonifen) on winter cereals.

7.2.3.1 Summary of European data and new data supporting the intended uses

New studies on the magnitude of residue have been submitted by the applicant in the framework of this application. These studies are summarized in the Table below. The detailed assessment of these studies is presented in 0.

Table 7.2-9: Summary of EU reported and new data supporting the intended uses of GLOB1310aH and conformity to existing MRL

Commodity	Source	Residue zone (N-EU, S-EU, EU, outside EU)	Evaluation GAP Residue levels (mg/kg) E = according to enforcement residue definition RA = according to risk assessment residue definition	STMR (mg/kg)	HR (mg/kg)	Unrounded OECD calculator MRL (mg/kg)	Current EU MRL (mg/kg) *	MRL compliance
Winter wheat	New trials, winter wheat (GLC2008)	N-EU	GAP 1 x 1080 g Aclonifen/ha, BBCH 14, outdoor Grain: E=RA: 8 x not detectable (< LOD 0.003 mg/kg, set at 30% LOQ of 0.01) Straw E=RA: 7 x not detectable (< LOD 0.003 mg/kg, set at 30% LOQ of 0.01) 1 x < LOQ (0.01 mg/kg)	0.0 0.0	0.003 0.01	NA NA	0.01 NA	Yes NA
	New trials, winter wheat (GLC2009)	S-EU	GAP 1 x 1080 g Aclonifen/ha, BBCH 14, outdoor					

			Grain: E=RA: 8 x not detectable (< LOD 0.003 mg/kg, set at 30% LOQ) Straw E=RA: 3 x not detectable (< LOD 0.003 mg/kg, set at 30% LOQ) 3 x < LOQ (0.01 mg/kg) 1 x 0.02 mg/kg 1 x 0.05 mg/kg	0.0 0.01	NA 0.05	0.01 0.08	0.01 NA	Yes NA

* Source of EU MRL: Reg. (EU) 2021/1531 ; the MRL is set at the limit of analytical quantification.

7.2.3.2 Effects on the residue level in pollen and bee products

Aclonifen is a systemic herbicide applied on winter cereals at pre-emergence and early post-emergence. Cereals are considered non-melliferous crop according to the SANTE/11956/2016 rev. 9. The application of GLOB1310aH is before the flowering stage and booting (BBCH≤14) in cereals, it is applied only at pre-emergence. Therefore, only the exposure through non-target plants and succeeding crops are relevant.

Referring to a recent publication (Maynard *et al*. (2015)[1]), it was shown that less than 2% of all weeds recorded in arable crops (wheat, oilseed rape, sugarbeet, sunflower, potatoes, maize, peas and beans) are at flowering growth stage when herbicides are applied. It can therefore be considered that the exposure of bees to in-field flowering weeds resulting shortly after application of an herbicide is not a realistic scenario as flowering weeds are not present in the field in significant quantities in realistic conditions. Similarly, in arable crops, the weeds present during application of the herbicide and which are not yet at the flowering growth stage (< BBCH 60) will not survive cultural practices aimed at eliminating them (i.e. herbicidal treatments, GLOB1310aH is an herbicide itself) so that exposure will also not occur at significant level.

Two rotational crop residue studies performed in root and tuber vegetables (turnip) were submitted by the notifier after the Annex I inclusion as confirmatory data. The two studies demonstrate that no residues above LOQ of 0.01 mg/kg are to be expected in root and tuber vegetables subsequent to treatment of antecedent crops (with treatment up to 2.4 kg aclonifen/ha). The maximum intended application rate of GLOB1310aH is 1.08 kg Aclonifen/ha. It is clear that no high residues are expected in succeeding crops for the use of GLOB1310aH.

Additionally, in the 2019 European Union report on pesticide residues in food (approved on 25 February 2021, EFSA Journal 2021;19(4):6491) data show no aclonifen residues in samples of honey and other apicultural products analysed throughout Europe.

According to the recent technical guidance on residue and MRL setting in honey MRL (SANTE/11956/2016 rev. 9), if the highest residue (HR) found are below 0.05 mg/kg, no further residue studies in honey are necessary and the default MRL of 0.05 mg/kg can be set. In the case of aclonifen in cereal grains, HR is below 0.05 mg/kg, therefore no further residue studies in honey are necessary and the default MRL of 0.05 mg/kg can be set. In conclusion, no exceedance of the default MRL in honey is expected based on the intended uses.

It has to be highlighted that according to the Standing Committee on Plants, Animals, Food and Feed Section Phytopharmaceuticals – Residues 13 – 14 June 2019: “The Commission considered that a better overview of the situation would be first needed and will ask EFSA to extract recent national monitoring data on honey from the database. It emphasized that the Guidance Document was drafted with a view to keep data requirements to a minimum, and that it would in principle support pragmatic approach”. Thus honey residues study is not required for non-target plants.

Comments of zRMS	On the basis of the available information, it should be concluded that there is no risk of aclonifen residues in bee products for the consumers.

[1] Maynard S.K., Albuquerque R., Weber C., von Mérey G., Geiger M.F., Becker R., Keppler J., Masche J., Brougham K, Coulson M., 1.8 Weeds in the treated field – a realistic scenario for pollinator risk assessment? Hazards of pestcides to bees – 12th International Symposium of the ICP-PR Bee Protection Group, Ghent (Belgium, September 15-17, 2014, Julius-Kühn-Archiv, 450, 2015.

7.2.3.3 Conclusion on the magnitude of residues in plants

According to the available data, the intended uses on winter wheat are considered acceptable, for outdoor uses.

The GAP in the residue trials is the critical GAP of the intended uses of GLOB1310aH. No quantifiable residues of aclonifen were determined in wheat grain (<0.01 mg/kg). Therefore, there are available sufficient data to support the use of GLOB1310aH according to the intended GAP. The data submitted show that no exceedance of the current EU-MRL of 0.01 mg/kg (Regulation (EU) No. 2021/1531 will occur.

Comments of zRMS	According to Technical Guideline on data requirements for setting maximum residue levels, comparability of residue trials and extrapolation of residue data on products from plant and animal origin (SANTE/2019/12752) the extrapolation from wheat to barley, rye, triticale and oat is possible.

7.2.4 Magnitude of residues in livestock

Aclonifen is authorised for use on several crops that might be fed to livestock. As reported in EFSA Journal 2015, the following crops were considered in the calculation of the dietary burden: maize silage and grain, peas dry, bans dry, lupins dry, sunflower seed meal and potato. The applicant followed the same approach for the selection of crops and use the excel tool OECD animal_model_2017. However, please note that within the excel tool it is recommended to include forage only when a specific GAP on forage is proposed (not the case here). The same inputs as in EFSA Journal 2015 have been entered in the tool. Please find here below in table 7.2-10 the input for the dietary burden calculation.

7.2.4.1 Dietary burden calculation

Table 7.2-10: Input values for the dietary burden calculation (considering the uses evaluated in Art. 12 procedure and the uses under consideration)

Feed Commodity	Median dietary burden		Maximum dietary burden**	
	Input value (mg/kg)	Comment	Input value (mg/kg)	Comment
Risk assessment residue definition: Aclonifen				
Forages				
Maize silage/forage***	0.02	STMR (EFSA, 2015)	0.02	HR (EFSA, 2015)
Roots and tubers				
Potato	0.02*	STMR	0.02*	STMR
Cereal grains/Crop seeds				
Maize grain	0.01*	STMR (EFSA, 2015)	**	
Peas seed dry	0.02	STMR	**	-
Beans seed dry	0.02	STMR	**	-
Lupins seed dry	0.01*	STMR	**	-
By-Products				

Feed Commodity	Median dietary burden		Maximum dietary burden**	
	Input value (mg/kg)	Comment	Input value (mg/kg)	Comment
Maize (milled by products)	0.01 x 1	STMR (EFSA, 2015) x default PF	**	-
Maize (hominy meal)	0.01 x 6	STMR (EFSA, 2015) x default PF	**	-
Maize (gluten feed)	0.01 x 2.5	STMR (EFSA, 2015) x default PF	**	-
Maize (gluten meal)	0.01	STMR (EFSA, 2015)	**	-
Distiller's grain (dried)	0.01 x 3.3	STMR (EFSA, 2015) x default PF	**	-
Lupin seed meal	0.01 x 1.1	STMR (EFSA, 2015) x default PF	**	-
Potato process waste****	0.02	STMR (EFSA, 2015)	**	-
Potato dried pulp****	0.02	STMR (EFSA, 2015)	**	-
Sunflower meal****	0.02*	STMR (EFSA, 2015)	**	-
New feed items related to the dRR and not previously considered				
Cereals Grain (Wheat, barley, oat, rye, triticale)	0.01	STMR	**	-
Straw (Wheat, barley, oat, rye, triticale)	0.01	STMR/HR	0.05	HR
Brewer's grain dried	0.01 x 3.3	STMR x default PF	-	-
Wheat gluten meal	0.01 x 1.8	STMR x default PF	-	-
Wheat milled by-products	0.01 x 7	STMR x default PF	-	-

*Indicate that the input values is proposed at the limit of quantification
**in OECD animal_model: no HR required for grains/seed if no post-harvest use (the GAP of GLOB1310aH does not include post-harvest treatment), no HR required for the by-products.
*** The GAP of GLOB1310aH does not include forage uses; however, to be in line with the uses reviewed in the Art. 12 of Aclonifen (EFSA, 2015) this use was included in the burden calculation
****For sunflower seeds meal, for potato waste and potato dried pulp, no default processing factor was applied because aclonifen is applied early in the growing season and residues are expected to be below the LOQ. Concentration of residues in these commodities is therefore not expected.

Table 7.2-11: Results of the dietary burden calculation

Animal species	Median dietary burden (mg/kg bw/d)	Maximum dietary burden (mg/kg bw/d)	Highest contributing commodity	Max dietary burden (mg/kg DM)	Trigger exceeded (Y/N)
Risk assessment residue definition: Aclonifen					
Beef cattle*	0.0027	0.003	Potato, process waste	0.11	Y
Dairy cattle*	0.0038	0.004	Potato, process waste	0.10	Y
Ram/ewe	0.0034	0.004	Potato, process waste	0.1	Y
Lamb	0.0028	0.003	Potato, culls	0.08	N
Breeding swine	0.002	0.002	Potato, culls	0.09	N
Finishing swine*	0.003	0.003	Potato, culls	0.09	N
Broiler poultry	0.002	0.002	Potato, culls	0.03	N
Layer poultry*	0.003	0.003	Potato, culls	0.04	N
Turkey	0.003	0.003	Potato, culls	0.04	N

* These categories correspond to those (formerly) assessed at EU level.

The calculated dietary burdens do not exceed the trigger value of 0.1 mg/kg DM for lamb, finishing and breeding swine, broiler poultry, layer poultry and turkey. While, the trigger was exceeded for beef cattle, dairy cattle, and ram/ewe. The metabolism of aclonifen was investigated in lactating goats following three different doses of aniline-labelled aclonifen: 0.036, 0.34 and 2.76 mg Aclonifen/kg bw/d. The lowest dose investigated in the metabolism study is equivalent to 9 times the highest calculated dietary burden (Ram/Ewe and Dairy cattle, 0.004 mg/kg bw/d, table above). The results of the lowest dose group are therefore considered relevant for the present risk assessment. The majority of the administered radioactivity (74 - 77 %) was excreted via urine and faeces. In the lowest dose group, residues in milk were maintained below 0.01 mg/kg during the whole dosing period. In the low dose group, total radioactivity in muscle, fat and kidney was clearly below 0.01 mg/kg. Liver was the only tissue where TRR exceeded 0.01 mg eq/kg (0.026 mg eq/kg). One third of this TRR was identified as aclonifen (0.009 mg/kg) while the rest was made up by at least three polar metabolites, none of them exceeding 0.01 mg eq/kg in liver tissue.

Moreover, in the EFSA report 2015 it is stated:
Aclonifen is authorised for use on crops that might be fed to livestock and the livestock dietary burden calculated for ruminants and pigs was found to exceed the trigger value of 0.1 mg/kg dry matter (DM). Metabolism of aclonifen was investigated in lactating goats. As metabolic pathways were generally found to be similar between rodents and ruminants, the results of the goat metabolism study can be extrapolated to pigs and the residue for monitoring and risk assessment in commodities of animal origin was defined as aclonifen only. Based on the metabolism study, it was concluded that residue levels of aclonifen remain far below 0.01 mg/kg in milk, muscle, fat, liver and kidney. A validated analytical method for enforcement of aclonifen with an LOQ of 0.01 mg/kg in these tissues is available. Therefore, MRLs and risk assessment values for the relevant commodities in ruminants and pigs were established at the LOQ level.

Therefore even when considering the worst case situation (HR in straw = 0.05 mg/kg observed in the supervised residue trials) no MRL exceedance is expected in milk and ruminant tissues. Consequently, further investigation of residues as well as MRL setting in commodities of animal origin are not required.

7.2.4.2 Livestock feeding studies (KCA 6.4.1-6.4.3)

As stated in EFSA, 2015:

"Based on the above mentioned metabolism study, it is concluded that, after exposure to the maximum dietary burden, residue levels of aclonifen remain far below the enforcement LOQ of 0.01 mg/kg in milk, muscle, fat, liver and kidney. Hence, a livestock feeding study is not needed. MRLs and risk assessment values for the relevant commodities in ruminants and pigs can be established at the LOQ level."

This applies also for the supported use of the product GLOB1310aH on winter wheat and livestock feeding studies are not considered necessary for this submission. There is no need to modify MRLs for foodstuff of animal origin. No new data were submitted in the framework of this application.

Comments of zRMS	Based on the available data intakes by livestock ≥ 0.1 mg/kg diet (dry weight basis) is not expected.

7.2.5 Magnitude of residues in processed commodities (Industrial Processing and/or Household Preparation) (KCA 6.5.2-6.5.3)

The Commission Guideline 7035/VI/95 rev. 5 states that processing studies are not normally required if no significant residues, i.e. no residues above 0.1 mg/kg, or no analytically determinable residues occur in the plant or plant product which would be processed, or if the total theoretical maximum daily intake (TMDI) is less than 10 % of the ADI. Since residue levels of Aclonifen in grain are lower than 0.1 mg/kg (i.e. no detectable residues), no processing studies are required to support the use of Aclonifen in winter cereals.

Comments of zRMS	As residues did not exceed the 0.1 mg/kg level and TMDI does not exceed 10 % of the ADI processing studies are not required.

7.2.6 Magnitude of residues in representative succeeding crops

The crops under consideration can be grown in rotation.

Considering available data dealing with nature of residues (see 0), no study dealing with magnitude of residues in succeeding crops is needed.

Comments of zRMS	The meeting of experts PRAPeR considered the rotational crop metabolism study and concluded that no significant residues would occur in all crop groups except root and tuber crops. It was concluded that positive residues of aclonifen could occur in rotational root and tuber crops. It was proposed that there could be a restriction not to plant root and tuber crops after application of aclonifen but no clear plant back interval was proposed. According to EFSA (2020): *"Therefore, two rotational crops field trials investigating the magnitude of aclonifen residues in turnips planted 30 and 60 days after application to bare soil of 2.4 kg a.s./ha (equivalent to 2.2N the application rate for the crop under assessment) were evaluated in the framework of MRL review (EFSA, 2015b). According to the results of both studies, no residues are expected in root and tuber* *vegetables grown in rotation with crops treated with aclonifen (residues were below the LOQ of 0.01 mg/kg in all samples of leaves and roots analysed).* *EFSA concluded that in rotational crops grown after the use of aclonifen according to the GAPs assessed in the current MRL application, residues above the LOQ are not expected."*

7.2.7 Other / special studies (KCA6.10, 6.10.1)

The available data for the active substance sufficiently address aspects of the residue situation that might arise from the use of GLOB1310aH. Therefore, other special studies are not needed.

7.2.8 Estimation of exposure through diet and other means (KCA 6.9)

Toxicological reference values relevant for dietary risk assessment are reported in the summary of the evaluation (see 0).

As ARfD was not deemed necessary, acute risk assessment is not relevant.

7.2.8.1 Input values for the consumer risk assessment

Consumer risk assessment calculations were performed taking into account all the crops for which an MRL has been set for Aclonifen under EU Regulation No 2021/1531. Where the MRL for a particular crop is below the LOQ, calculations have been made with the LOQ for that crop.

Table 7.2-15: Input values for the consumer risk assessment

Commodity	Chronic risk assessment	
	Input value (mg/kg)	Comment
Risk assessment residue definition: Aclonifen		
All commodities	MRL	Reg. (EU) 2021/1531

7.2.8.2 Conclusion on consumer risk assessment

Chronic exposure calculations for all crops were performed using revision 3.1 of the EFSA Pesticide Res-

idues Intake Model (PRIMo) (EFSA, 2019). Results are shown in table 7.2-12 below. Extensive calculation sheets are presented in 0.

Table 7.2-16: Consumer risk assessment

TMDI (% ADI) according to EFSA PRIMo	2 % (based on NL toddler, milk:cattle main contributor 0.9%)
IEDI (% ADI) according to EFSA PRIMo	No IEDI calculations were performed as the TMDI calculations using the MRLs were already acceptable. No refinement of the chronic risk assessment is required.
IESTI (% ARfD) according to EFSA PRIMo*	No IESTI calculations were performed as no ARfD was set.
NTMDI (% ADI) **	No NTMDI model available.
NEDI (% ADI)**	No NEDI calculations were performed as the TMDI calculations using the MRL were already acceptable. No refinement of the chronic risk assessment is required.
NESTI (% ARfD) **	No NESTI calculations were performed as no ARfD was set

* include raw and processed commodities if both values are required for PRIMo
** if national model is available

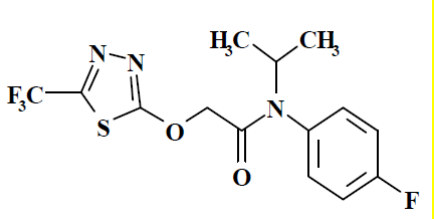
The proposed uses of Aclonifen in the formulation GLOB1310aH do not represent unacceptable chronic risks for the consumer.

Comments of zRMS	The estimated long-term dietary intake is below the ADI. The diet with the highest TMDI is NL toddler population with 2% of ADI. For this diet, the highest contributor is milk with 0.9% of ADI. The proposed use of aclonifen in the formulation GLOB1310aH does not represent unacceptable chronic risks for the consumer. No acute exposure assessment performed (no ARfD value established).

7.3 Flufenacet

General data on flufenacet are summarized in the table below

Table 7.3-1: General information on flufenacet

Active substance (ISO Common Name)	Flufenacet
IUPAC	4'-fluoro-N-isopropyl-2-[5-(trifluoromethyl)-1,3,4-thiadiazol-2-yloxy]acetanilide
Chemical structure	
Molecular formula	$C_{14}H_{13}F_4N_3O_2S$
Molar mass	363.34 g/mol
Chemical group	oxyacetamide

Mode of action (if available)	Flufenacet affects cell membranes of meristematic tissues in these grass species, interfering with both membrane selectivity and permeability. This prevents cell division, therefore preventing unwanted grass species from growing
Systemic	yes
Company (ies)	Bayer
Rapporteur Member State (RMS)	France
Approval status	Approved Date of (01/01/2004) and reference to decision (03/84/EC Reg. (EU) 2017/1511Reg. (EU) No 540/2011Reg. (EU) No 823/2012 (Reg. (EU) 2016/950) Reg. (EU) 2020/1511
Restriction	Only uses as herbicide may be authorised.
Review Report	SANCO/7469/VI/98-Final, 03 July 2003
Current MRL regulation	Reg. (EU) No 1127/2014
Peer review of MRLs according to Article 12 of Reg No 396/2005 EC performed	Yes
EFSA Journal : Conclusion on the peer review	No
EFSA Journal: conclusion on article 12	Yes, EFSA 2012; 10(4):2689
Current MRL applications on intended uses	~~EFSA Journal 2012;10(4):2689~~ None ~~Cereals~~ ~~Status: Reasoned opinion available~~

* Notifier in the EU process to whom the a.s. belong(s)

7.3.1 Stability of Residues (KCA 6.1)

7.3.1.1 Stability of residues during storage of samples

Available data
No new data submitted in the framework of this application.

The freezer storage stability of flufenacet (FOE 5043) and 5 of its metabolites (FOE-oxalate, FOE sulfonic acid, FOE thioglycolate sulfoxide, FOE methylsulfoxide, and FOE methylsulfone) was examined in commodities of three different crops, representing oil-, starch- and water containing materials. Storage stability data were considered appropriate in the Monograph (France 1997; Annex B 6) and in the EFSA Reasoned Opinion on existing MRLs (EFSA Journal 2012;10(4): 2689).

Storage stability of flufenacet was demonstrated for a period of 20 months at -21°C in commodities with high water content (turnip). Also, storage stability of flufenacet was demonstrated for a period of 28 months at -21°C in commodities with high oil content (soya bean) and dry commodities (maize grain). The storage stability of flufenacet was not studied in commodities with high acid content. However, given that storage stability was demonstrated in the other three crop groups and that a total residue definition applies, and this moiety was found to be stable under several hydrolysis conditions, further investigation in cereal straw and commodities with high acid is not considered necessary (EFSA Journal 2012;10(4): 2689).

Table 7.3-2: Summary of stability data achieved at ≤ - 18°C (unless stated otherwise)

Matrix	Characteristics of the matrix	Acceptable Maximum Storage duration	Reference
Data relied on in EU			
Plant products			
Turnip	High water content	20 months	Monograph, 1997; EFSA Journal, 2012
Soy bean	High oil content	28 months	Monograph, 1997; EFSA Journal, 2012
Maize grain	Dry commodities	28 months	Monograph, 1997; EFSA Journal, 2012

Conclusion on stability of residues during storage

Available data are sufficient to cover the trails on winter cereals supporting the intended uses of GLOB1310aH.

Comments of zRMS	The zRMS agrees with the conclusions provided by the applicant regarding storage stability of flufenacet. Since cereals belong to the dry commodities, the storage stability is adequately demonstrated for the commodities under assessment.

7.3.1.2 Stability of residues in sample extracts (KCA 6.1)

Relevant information on the stability of flufenacet residues in the final extracts was investigated during development of method 00346 reported in the Annex II dossier (Monograph France, 1997). The analytical solution of control samples of wheat (green material, grain and straw) in tert-butyl methyl ether (MTBE) was fortified with the analytical target 4-fluoro-N-methylethyl benzenamine trifluoroa-cetamide 5FOE5043) resulting from derivatisation. These solutions were analyzed on the day of preparation as well as four and eight weeks later. During this period the samples were stored in the refrigerator (about +4°C). The extracts have shown to be stable over these periods.

For analysis of flufenacet in the residue trials performed with GLOB1310aH the maximum storage interval of final sample extracts at typically 1 °C to 10 °C from extraction until injection to LC-MS/MS was two days for grain and three days for straw. The stability of the analytes in the final extracts of wheat (grain and straw) upon storage at typically 1 °C to 10 °C for at least 10 days was demonstrated in study S20-09167 (filed in Part B5 within this dossier as KCP 5.2-02). For clarity sake a summary is included in Appendix 2

7.3.2 Nature of residues in plants, livestock and processed commodities

7.3.2.1 Nature of residue in primary crops (KCA 6.2.1)

No new data submitted in the framework of this application.

Available data

Table 7.3-3: Summary of plant metabolism studies

Crop Group	Crop	Label position	Application and sampling details					Reference
			Method, F or G (a)	Rate (kg a.s./ha)	No	Sampling (DAT)	Remarks	
EU data								
Root vegetables	Potatoes	Fluoro-phenyl-U-^{14}C	Soil, F/G (b)	2.6	1	40, 109 days after planting	-	EFSA, 2012
			Foliar, F (b)	3.0	1	67	-	EFSA, 2012
Pulses and oilseed	Cotton	Fluoro-phenyl-U-^{14}C	Soil, G	1.778	1	21, 43, 156 days after planting	Samples; 1st and 2nd inmature harvest, final harvest	EFSA, 2012; Monograph (France 1997)
	Soybean	Fluoro-phenyl-U-^{14}C	Soil, G	1.485	1	20, 42, 66, 80 days after planting	Samples: whole plant, forage and beans, hay	EFSA, 2012; Monograph (France 1997)
		Thiadiazole-2-^{14}C	Soil, F/G (b)	1.38	1	21, 48, 91, 105 days after planting	Samples: whole plant, forage and beans, hay	EFSA, 2012; Monograph (France 1997)
Cereals	Maize	Fluoro-phenyl-U-^{14}C	Soil, F	1.37	1	96, 110 days after planting	Sample: fodder and fresh/dry kernels	EFSA, 2012; Monograph (France 1997)
		Fluoro-phenyl-U-^{14}C	Foliar, G	1.5	1	Forage: 82 Grain and fodder: 129	-	EFSA, 2012
		Fluoro-phenyl-U-^{14}C	Foliar, F	0.52	1	Forage: 18 Hay: 33 Straw 66 Grain: 59 and 66	-	EFSA, 2012

Summary of plant metabolism studies reported in the EU

Post-emergence studies on wheat and pre- and post-emergence studies on potatoes were evaluated by the RMS after inclusion.

In potato (pre-emergence) the highest TRR was seen in immature tubers (up to 1.88 mg eq./kg). In the post-emergence study, samples of immature tubers were not taken; mature tubers had levels of TRR of up to 0.41 mg eq./kg which was similar to the TRR seen in mature tubers from the pre-emergence study. Parent compound was not detected in any of the potato samples. Two major metabolites were identified; the flufenacet cysteine conjugate (M23) and flufenacet sulfanyl lactic acid glucoside, which accounted for 43 to 52 % and 17 to 31 % of the TRR, respectively. These were the only major metabolites irrespective of the time of treatment or sampling. Using HPLC-partitioning, 14 or 9 compounds were characterized in the samples of mature tubers, which had been treated pre- or post-emergence, respectively. However, each compound accounted for 6% of the TRR at the most, and did not exceed 0.02 mg/kg. Since the field phase of the study used an exaggerated rate (approximately four times rate of the GAP supported in the framework of this review), these components did not require specific identification following the characterization work performed.

In the pre-emergence study (evaluated in the DAR) on maize, the highest TRR was seen in fodder (0.498 mg eq./kg). In maize kernels (fresh and dry), residues were too low for identification (0.009 mg eq./kg and 0.012 mg eq./kg respectively). The highest residue levels were found in forage and fodder, where flufenacet oxalate (M1) accounted for up to 44 % of the TRR. Flufenacet thioglycolate sulfoxide (M4) and flufenacet sulfinyl lactic acid (M33) were also found in forage and fodder accounting for up to 11 % and 10 % of the TRR, respectively, all other components were below 10 % of the TRR. Parent flufenacet was completely degraded and not found in either forage or fodder.

In the post-emergence study (evaluated by the RMS after inclusion) on maize, forage, fodder and grain were sampled; the highest TRR was seen in fodder (1.91 mg eq./kg). No parent compound was detected in any matrix. Nine metabolites were identified and four of these were found in all three crop parts: flufenacet sulfinyl lactic acid glucoside (6 to 23% of TRR), flufenacet thioglycolate sulfoxide (5 to 9% of TRR) and two diastereomers of flufenacet sulfinyl lactic acid (diastereomer I: 2 to 5% of TRR, diastereomer II: 2 to 19%). Flufenacet oxalate was found in forage (27% of TRR) and fodder (22% of TRR) but not in grain. Flufenacet sulfanyl lactic acid glucoside was found in forage only (25% of TRR) and the flufenacet malonylcysteine conjugate was seen in fodder only (16% of TRR). Flufenacet sulfonic acid (M2) and flufenacet methylsulfoxide$_{18}$ were observed in grain only (4 and 7% of TRR, respectively).

A post-emergence study on wheat was evaluated by the RMS after inclusion. The highest TRR was seen in hay (up to 4.66 mg eq./kg), levels in grain were lower (up to 0.74 mg eq./kg). No parent compound was observed in any matrix. Eight metabolites were identified, the most significant was flufenacet oxalate which occurred in all the crop parts (14 to 65% of TRR) and was the main metabolite in grain (65% of TRR). Two diastereomeric forms of flufenacet sulfinyl lactic acid glucoside were also determined in all four plant parts (<1 to 10% of TRR for both diastereomers). Additionally, in forage, hay and straw, the following compounds were found: two diastereomers of flufenacet sulfinyl lactic acid (20 to 26% and 4 to 9% of TRR for diasteromer I and II respectively), flufenacet thioglycolate sulfoxide (2 to 7% of TRR), and flufenacet sulfanyl lactic acid glucoside (<1 to 21% of TRR). Finally, flufenacet sulfonic acid was observed to occur in straw only (15% of TRR).

In cotton the highest TRR was identified in forage harvested at 21 days (1.64 mg eq./kg). High levels were also seen in the mature plant (1.54 mg eq./kg). In the seeds, residues were too low for identification (0.067 mg eq./kg). Flufenacet oxalate was the most important component of the residue in forage (29 % TRR) and flufenacet sulfonic acid was the main component of the TRR in the mature plant, accounting for 66 % of the TRR. All other metabolites in all crop parts were below 10 % of the TRR and parent flufenacet was completely degraded and not found at all.

In soya bean (fluoro-phenyl-U-^{14}C labelled study) the highest TRR was identified in hay (21.73 mg eq./kg) and dry beans at final harvest (1.02 mg eq./kg). In hay and forage three metabolites (flufenacet oxalate, flufenacet sulfonic acid and flufenacet thioglycolate sulfoxide) were present at similar levels and together accounted for 74 – 88 % TRR. Flufenacet thioglycolate sulfoxide was the main component of the TRR in beans, accounting for 26 % of the TRR in beans (80 days) whereas other metabolites were below 10 % of the TRR. Parent flufenacet was completely degraded and not found in any of the samples taken at

any time.

In soya bean (thiadiazole-2-^{14}C labelled study) the highest TRR seen in the early samples was in forage (2.60 mg eq./kg); and in general the levels of TRR were comparable to those in the fluorophenyl labelled study. In the later samples the highest TRR was identified in hay (5.78 mg eq./kg) and in general the levels of TRR were lower, compared to the fluorophenyl labelled study. The only identified component of the TRR in 21 and 48 day forage was an N-glucoside conjugate of thiaodone, accounting for 68 % and 61 % of TRR, respectively; the remaining TRR was either unextracted or could not be identified. The N-glucoside conjugate of thiaodone was also the most important component of the residue in 91 day forage and hay (58 % and 66 % TRR, respectively) but a group of four minor metabolites characterised as thiadone conjugates were also present at levels up to 19 % (total of the four conjugated metabolites). The only known component of the TRR in 91 day beans was tentatively identified as an N-malonylalanine conjugate of thiadone, accounting for 66 % of TRR; the remaining fractions were not analysed due to low amounts of radioactivity. Parent flufenacet was completely degraded and not found in any of the samples taken at any time.

As fluorine is present in both rings of the flufenacet molecule, F NMR was also used to analyse all of the metabolites. It was confirmed, that five metabolites containing the fluorophenyl moiety of the molecule were present in all crops (flufenacet oxalate, flufenacet sulfonic acid, flufenacet thioglycolate sulfoxide, flufenacet methylsulfoxide and flufenacet methylsulfone$_{21}$). F NMR was also used to compare extracts from the crops treated with fluoro-phenyl-U-^{14}C and soya bean extracts from the study using thiadiazole-2-^{14}C; the results indicated the metabolic profile was broadly similar in both cases.

Based on the above studies, a comparison of the metabolism for crops treated pre- and post-emergence shows the main difference in metabolism is in the formation of glucose conjugates which are seen at higher levels. The metabolism of flufenacet is considered to be qualitatively similar in all examined crops. These include representatives of three different crop groups; cereals (maize, wheat), pulses and oilseeds (cotton, soya bean), and root vegetables (potatoes).The major metabolites detected in treated plants were cleavage products of the parent compound including flufenacet oxalate and conjugates of thiadone. Metabolism appears to follow the cleavage of flufenacet into the thiadiazole and acetamide moieties.

Regarding the fate of the thiadiazole moiety on one hand, the results of the study show that thiadone is either conjugated or degraded and incorporated into naturally occurring compounds. Furthermore, the residues resulting from thiadiazole-2-^{14}C-labelled flufenacet were shown to be significantly lower than those arising from fluorophenyl-U-^{14}C-labelled flufenacet. Residues arising from thiadiazole-2- ^{14}C labelled flufenacet are considered to be low, no free thiadone was observed (various conjugates of thiadone were seen; the most significant were the N-glucoside & N-malonylalanine conjugates) and a bioavailability study with the predominant glucose conjugate showed that it was rapidly excreted unchanged in the urine of rats. It was therefore concluded, in the DAR, that the metabolism of the thiadiazole moiety of flufenacet is considered to be adequately understood on the basis of the study. Furthermore it is concluded that metabolites containing the thiadone moiety are not relevant and should not be included in the residue definition.

The acetamide moiety (fluorophenylacetamide) on the other hand is directly conjugated with glutathione or homoglutathione and further metabolised yielding the flufenacet cysteine conjugate. Metabolites including flufenacet sulfonic acid, flufenacet thioglycolate sulfoxide and flufenacet sulfinyl lactic acid can be considered hydrolysis, oxidation and conjugation products of the glutathione pathway, although flufenacet oxalate (also containing the fluorophenylacetamide moiety) probably arose through direct oxidation of the unobserved primary alcohol hydrolysis of flufenacet alcohol (M23). Based on the available data, the fate of the acetamide moiety of flufenacet is considered to be well understood.

None of the metabolites flufenacet oxalate, flufenacet sulfonic acid, flufenacet thioglycolate sulfoxide, N-glucoside conjugate of thiaodone, flufenacet sulfinyl lactic acid or N-malonylalanine conjugate of thiadone are identified as being formed in rats at 1 % or more of the administered dose. The only metabolite with any toxicity data is flufenacet sulfonic acid, which has a bacterial mutagenicity test and an acute oral

toxicity test, it has no repeat dose toxicity data. It is not possible to draw any reliable conclusions on the absolute or relative toxicity of these plant metabolites based on the available data. Resolution of the relevance of these metabolites should await the outcome of the PPR panel opinion on metabolites (due early 2012). Requesting new *in vivo* toxicity studies now might result in unnecessary use of animals if the PPR opinion supports approaches such as the Threshold of Toxicological Concern (TTC) or *in silico* methods that avoid or minimise the need for animal data. However, since none of the metabolites raised any particular concern it is considered acceptable to apply the toxicological reference values of the parent compound for the time being.

Consequently, since the metabolism of the fluorophenyl-U-^{14}C labelled flufenacet results in a number of metabolites which all have the N-isopropyl-4-flurophenyl moiety, a 'total residue' approach has been proposed and the residue for risk assessment and enforcement is defined as the sum of all compounds containing the N-fluorophenyl-N-isopropyl moiety expressed as flufenacet equivalent. This residue definition is applicable to all crops when application is made pre- and early post-emergence.

Summary of new plant metabolism studies

No new studies submitted within the frame of this application.

Conclusion on metabolism in primary crops

The intended GAP of GLOB1310aH is defined as pre-emergence application to winter cereals at application rates up to 120 g flufenacet/ha. Therefore, this use is within the frame evaluated in the EU peer review (up to 240 g a.s./ha) and the conclusions drawn in the Monograph (France 1997) and in the EFSA reasoned opinion (2012) are still considered valid. The use available data are sufficient to support the intended use of GLOB1310aH on winter cereals.

Comments of zRMS	Primary crop metabolism of flufenacet was investigated for pre-emergence treatment on cereals and pulses & oilseeds using fluorophenyl-U-14C labelled flufenacet. A study for pre-emergence treatment on pulses & oilseeds was conducted using thiadiazole-2-14C labelled flufenacet. In addition pre-emergence and foliar treatment metabolism studies on root vegetables and cereals (foliar treatment only) using fluorophenyl-U-14C labelled flufenacet were evaluated. The metabolism of the fluorophenyl moiety of flufenacet results in a number of metabolites which all have the N-isopropyl-4-flurophenyl moiety. A 'total residue' approach has been proposed and the current residue definition for risk assessment and enforcement is the sum of all compounds containing the N-fluorophenyl-N-isopropyl moiety expressed as flufenacet equivalent.

7.3.2.2 Nature of residue in rotational crops (KCA 6.6.1)

Available data

No new data submitted in the framework of this application.

Two confined rotational crop studies investigating the nature of residues. In the studies bare soil was treated with 0.9 kg a.s./ha. Confined rotational crop studies with flufenacet were conducted using the ^{14}C-labelled test substance, the radiolabel being in the [fluorophenyl-UL-^{14}C] and in the [thiadiazole-2-^{14}C]-position. These studies were evaluated in the EU peer review (France 1997) and considered acceptable.

Table 7.3-4: Summary of metabolism studies in rotational crops

Crop group	Crop	Label position	Application and sampling details					Reference
			Method, F or G *	Rate (kg a.s./ha)	Sowing intervals (weeks)	Harvest Intervals (DAT)	Remarks	
EU data								
Leafy vegetables	Kale	Fluoro-phenyl-U-^{14}C	Soil, F/G (b)	0.9	1, 4-5 and 12 months	At harvest	-	Monograph (France 1997)
		Thia-diazole-2-^{14}C	Soil, F/G (b)	0.9	1, 4-5 and 12 months	At harvest	-	Monograph (France 1997)
Root and tuber vegetables	Turnip	Fluoro-phenyl-U-^{14}C	Soil, F/G (b)	0.9	1, 4-5 and 12 months	At harvest	-	Monograph (France 1997)
		Thia-diazole-2-^{14}C	Soil, F/G (b)	0.9	1, 4-5 and 12 months	At harvest	-	Monograph (France 1997)
Cereals	Wheat	Fluoro-phenyl-U-^{14}C	Soil, F/G (b)	0.9	1, 4-5 and 12 months	At harvest	-	Monograph (France 1997)
		Thia-diazole-2-^{14}C	Soil, F/G (b)	0.9	1, 4-5 and 12 months	At harvest	-	Monograph (France 1997)

* Outdoor/field application (F) or glasshouse/protected/indoor application (G)
(b) Plants were placed in the greenhouse and moved outside when weather conditions permitted

Summary of plant metabolism studies reported in the EU

In the DAR it was concluded that the results of the confined rotational crop studies demonstrate that the metabolism in primary and secondary crops is similar. TRR was lowest in turnip roots: 0.02 to 0.06 mg/kg, and highest in wheat grain: 0.17 up to 6.94 mg/kg (at the 33 day plant back interval). TRR in wheat straw was also high: 0.61 mg/kg up to 7.82 mg/kg (at the 33 day interval). TRR in turnip tops and immature wheat was generally low (0.03 to 0.41 mg/kg) except at the 33 day interval (1.97 mg/kg in immature wheat). No parent compound was found and all the metabolites are derived by the same metabolic processes, via glutathione or homoglutathione, which is common to all plant species. Although several additional metabolites were only observed in the rotational crops they are considered to be the products of further metabolism of known metabolites. Most of them are detectable with the total residue method and/or are considered as being of no relevance because they are not expected to appear in significant amounts. The only metabolites not detectable, because they do not possess the common moiety, are flufenacet des-isopropyl oxalate and flufenacet 3-OH-des-isopropyl oxalate; of these only flufenacet des-isopropyl oxalate was found at levels above 10% of TRR; in immature wheat from the 33 and 157 day plant-back (10.8% of TRR (1.97 mg/kg) and 14.6% of TRR (0.06 mg/kg), respectively) and turnip root from the 361 day plant-back (13.3% of TRR (0.02 mg/kg)).

A specific residue definition for rotational crops is not considered necessary as metabolism in primary and rotational crops was found to be similar and very low residue levels are expected.

Summary of new plant metabolism studies

No new studies are submitted within the framework of this application.

Conclusion on metabolism in rotational crops

The supported use pattern and application rates for the product GLOB1310aH (max. 120 g flufenacet/ha) are within the frame evaluated in the EU peer review (Monograph, France, 1997) and therefore the conclusions drawn in the Monograph and in the EFSA reasoned opinion (EFSA 2012) are still valid.

Comments of zRMS	Occurrence of flufenacet residues in rotational crops was investigated during the peer review. A study showed that metabolism in primary and rotational crops is comparable and significant residues in rotational crops are not expected.

7.3.2.3 Nature of residues in processed commodities (KCA 6.5.1)

Available data

No new data submitted in the framework of this application. The data on hydrolytic degradation of flufenacet is summarised in the following table.

Conditions	Identified compounds	Reference
EU data		
Hydrolitic degradation (30 days, 25°C, pH 5, 7, 9), simulation of relevant hydrolytic conditions	parent flufenacet and all its derivatives and metabolites which comprise the N-fluorophenyl-N-isopropyl functional group	Monograph (France 1997)

The effect of processing on the nature of flufenacet was investigated in the framework of the peer review. Studies on the hydrolytic degradation of flufenacet at pH 5, 7 and 9 and incubated for 30 days in the dark at 25°C (relevant to environmental conditions) showed that the parent compound is not significantly affected by this process (France, 1997). This information would in principle not be considered sufficient because it only investigates the hydrolytic stability of the parent compound which is not expected in the raw agricultural commodities. However, as the residue definition in plant commodities is based on a common moiety, it seems unlikely that new metabolites not covered by the common moiety method would be generated. The relevant residue for enforcement and risk assessment in processed commodities is therefore expected to be the same as for primary crops.

Studies investigating the magnitude of residues in processed commodities of maize and soya bean were reported in the framework of the peer review (France, 1997). The studies were carried out in the US and exaggerated application rates were used. In the field phase of the studies flufenacet was applied at a rate of 4.9 kg as/ha (approximately 8 times the EU GAP). No robust processing factors for enforcement and risk assessment could be derived as they were not sufficiently supported by studies; a minimum of three processing studies is normally required. However it is noted that the results show that, at the exaggerated dose rates, residues of flufenacet are below the LOQ in both the raw agricultural commodities and the processed products and no concentration of flufenacet was observed.

Further processing studies are not required in this case as they are not expected to affect the outcome of the risk assessment.

Comments of zRMS	Studies on the hydrolytic degradation of flufenacet and studies on the magnitude of residues in processed commodities of maize and soya bean indicate that processing is not expected to have a significant impact on the composition or magnitude of residues in matrices of plant origin.

7.3.2.4 Conclusion on the nature of residues in commodities of plant origin

(KCA 6.7.1)

Table 7.3-5: Summary of the nature of residues in commodities of plant origin

Endpoints	
Plant groups covered	Cereals (maize, wheat), pulses and oilseeds (soybean, cotton)
Rotational crops covered	Turnips, kale, cereals
Metabolism in rotational crops similar to metabolism in primary crops?	Yes
Processed commodities	Flufenacet and all its derivatives and metabolites which comprise the N-fluorophenyl-N-isopropyl functional group which may originate during processing are covered by the residue definition of the primary crop
Residue pattern in processed commodities similar to pattern in raw commodities?	Yes
Plant residue definition for monitoring	Flufenacet (sum of all compounds containing the N-fluorophenyl-N-isopropyl moiety expressed as flufenacet)
Plant residue definition for risk assessment	Flufenacet (sum of all compounds containing the N-fluorophenyl-N-isopropyl moiety expressed as flufenacet)
Conversion factor from enforcement to RA	Not needed

7.3.2.5 Nature of residues in livestock (KCA 6.2.2-6.2.5)

Available data

No new data submitted in the framework of this application.

The nature of flufenacet residues in commodities of animal origin was investigated in the framework of Directive 91/414/EEC (France, 1997). Reported metabolism studies include one on lactating goats and one on laying hens, both using fluorophenyl-U-^{14}C, flufenacet oxalate and thiadiazole-2-^{14}C labelled flufenacet. The characteristics of these studies are summarised in Table 7.3-6.

Table 7.3-6: Summary of animal metabolism studies

Group	**Species**	**Label position**	**No of animal**	**Application details**		**Sample details**		**Reference**
				Rate (mg/kg bw/d)	**Duration (days)**	**Commodity**	**Time of sampling**	
EU data								
Lactating ruminants	Goat	Fluorophenyl-U-^{14}C and Thiadiazole-2-^{14}C	1	5	3	Milk	Twice daily	Monograph (France 1997)
						Urine and faeces	Not sampled	
						Tissues	At sacrifice (4 hours after final dose)	
		Flufenacet oxalate	1	5.12	3	Milk	Daily and after sacrifice	Monograph (France

						Urine and faeces	Not sampled	1997)
						Tissues	At sacrifice (4 hours after final dose)	
Laying poultry	Hens	Fluorophenyl-U-^{14}C and Thiadiazole-2-^{14}C	10	5	3	Eggs	2 days after first dose	Monograph (France 1997)
						Excreta	Not sampled	
						Tissues	At sacrifice (3-4 hours after final dose)	
		Flufenacet oxalate		5	3	Eggs	Daily	Monograph (France 1997)
						Excreta	Not sampled	
						Tissues	At sacrifice (4 hours after final dose)	

Summary of livestock metabolism studies reported in the EU

The metabolism studies with the fluorophenyl-U-14C labelled flufenacet on both ruminant and poultry show that the flufenacet glutathione conjugate (58% TRR in goat liver), the cysteine conjugate (55% TRR in goat fat), the N-acetyl conjugate (24% TRR in goat kidney), flufenacet methylsulfone (17% TRR in hen fat), 4-fluoroaniline methylsulfonyl acetamide (22% TRR in goat muscle), N-(4- fluorophenyl) acetamide (19% TRR in hen muscle), N-(4-fluorophenyl)-N-(2-hydroxy-1-methyl-ethyl)-2-(methylsulfinyl) acetamide29(8% TRR in hen muscle), N-(4-fluorophenyl)-N-(2-hydroxy-1-methylethyl)-2-(methylsulfonyl) acetamide (22% TRR in hen muscle) and N-(4-fluorophenyl)-N- (1-methylethyl) acetamide (3% TRR in hen liver) are the main components of the residue in animal tissues and milk products. Parent flufenacet was detected in small amounts (2% of TRR) in the fat and muscle of ruminants and in the fat (up to 55% TRR), muscle (3% TRR) and eggs (7% TRR) of poultry.

The metabolism studies with the thiadiazole-2-14C labelled flufenacet on both ruminant and poultry show that flufenacet is rapidly cleaved at the ether bond yielding thiadone (89% TRR in goat kidney and fat) which is then, primarily, conjugated to glucuronic acid (to form thiadone glucoronide) (9% TRR in goat kidney) prior to elimination. Parent flufenacet was not detected at all in ruminants and was only found in the fat (15% TRR) of poultry. It is noted that the studies in ruminant and poultry show that the residue levels after administration of thiadiazole-2-14C labelled flufenacet are approximately 3 to 14 times higher than after administration of fluorophenyl-U-14C labelled flufenacet. This is to be expected as the products of the initial cleavage reaction undergo further metabolism and elimination at different rates, due to the different polarities of the metabolites. However, metabolites containing the thiadiazole moiety are anyhow not expected to occur in commodities of animal origin because parent flufenacet is rapidly hydrolysed in plants and metabolites included in the plant residue definition no longer contain this moiety.

The metabolism studies with fluorophenyl-U-14C labelled flufenacet oxalate on ruminant and poultry show that flufenacet oxalate is essentially not metabolised by the animal. The low levels in tissue, milk and eggs suggest that flufenacet oxalate is minimally absorbed and rapidly excreted after oral administration. This was confirmed by a bio-availability study of flufenacet oxalate in rats which also found that the compound is not metabolised and is rapidly excreted as flufenacet oxalate in the faeces and urine. The general metabolic pathways in rodents and ruminants were found to be comparable; the findings in ruminants can therefore be extrapolated to pigs.

Consequently, for commodities of animal origin, it is desirable to include all metabolites containing the

N-fluorophenyl-N-isopropyl moiety. The metabolism studies performed with flufenacet indicate a wide range of metabolites containing the N-fluorophenyl-N-isopropyl moiety are formed. These studies were not considered to be fully representative because in practice livestock will not be exposed to flufenacet but to a mixture of flufenacet oxalate, flufenacet sulfonic acid and flufenacet thioglycolate sulfoxide and other metabolites. Nevertheless, the additional metabolism studies with flufenacet oxalate indicate that flufenacet oxalate is the only relevant compound in all matrices and although it is not completely clear how the other plant metabolites will be metabolised in livestock, a residue definition including all metabolites with the N-fluorophenyl-N-isopropyl moiety is expected to be the most appropriate, both for enforcement and risk assessment.

On the basis of the animal metabolism studies it is concluded that, after exposure to the maximum dietary burden (about 200 times lower than the dose level in the metabolism studies), residue levels in livestock commodities are expected to remain below the enforcement LOQ of 0.01 mg/kg in milk, 0.02 mg/kg in liver and 0.05 mg/kg in fat, eggs, kidney and muscle. Hence, no livestock feeding study is needed; MRLs and risk assessment values for the relevant commodities in ruminants, pigs and poultry can be established at the LOQ level.

A feeding study on dairy cattle was however carried out in the US in accordance with US EPA guidance and this study was considered in the peer review. Since parent flufenacet is not generally seen in plant matrices the study was performed using flufenacet oxalate as a representative metabolite. The results of the study show that no detectable residues of flufenacet oxalate are to be expected in products of animal origin which have been fed crops treated with flufenacet.

Conclusion on metabolism in livestock

European data are sufficient to support the intended use of GLOB1310aH on winter cereals.

Comments of zRMS	Based on the animal metabolism studies it is concluded that, after exposure to the maximum dietary burden, residues are expected to be at a level not exceeding the current MRL for animal commodities.

7.3.2.6 Conclusion on the nature of residues in commodities of animal origin (KCA 6.7.1)

Table 7.3-7: Summary on the nature of residues in commodities of animal origin

	Endpoints
Animals covered	Lactating goats
	Laying hens
Time needed to reach a plateau concentration	≥3 days in milk at high overdose (>100N) (Monograph, France); residues <LOQ
	≥3 days in milk at high overdose (>100N) (Monograph, France); residues <LOQ
Animal residue definition for monitoring	The sum of all compounds containing the N-fluorophenyl -N-isopropyl moiety, expressed as flufenacet
Animal residue definition for risk assessment	The sum of all compounds containing the N-fluorophenyl- N-isopropyl moiety, expressed as flufenacet
Conversion factor	Not applicable, not needed

Metabolism in rat and ruminant similar	Yes
Fat soluble residue	No (EFSA, 2012; Mongraph, France 1997)

* A more recent proposal by EFSA may be provided as additional information (EFSA RO XXXX)
** If no EFSA proposal is available, a proposal should be made by the applicant/zRMS.
*** If metabolism in rat and ruminant are not similar

Comments of zRMS	It is proposed to define the residues definition for monitoring and risk assessment in commodities of plant and animal origin as the sum of all compounds containing the N-fluorophenyl moiety, expressed as flufenacet.

7.3.3 Magnitude of residues in plants (KCA 6.3)

7.3.3.1 Summary of European data and new data supporting the intended uses

The residue data on winter cereals were evaluated during the EU review of flufenacet. Reference to these studies can be made to support the intended use of GLOB1310aH. Reference can be made to these studies to support the intended uses of GLOB1310aH.

In the DAR the results of 18 residue trials in total on common cereal species conducted in the northern part of Europe were described. The crops that were tested are wheat, barley, rye and triticale. Residues in grain and straw following treatment at up to 0.260 kg flufenacet/ha were all below limit of quantification, which is 0.05 and 0.10 mg/kg respectively. These trials support the GAP applied for in this submission as treatments at up to 0.120 kg flufenacet/ha pre-emergence are described. Moreover, these trials show that residues in grain and straw following treatment at up to 0.24 kg a.i./ha were always below the current MRLs.

Table 7.3-8: Summary of EU reported supporting the intended uses of GLOB310aH and conformity to existing MRL (EFSA Journal 2012; 10(4):2689)

Commodity	Source	Residue zone (N-EU, S-EU, EU, outside EU)	Evaluation GAP Residue levels (mg/kg) E = according to enforcement residue definition RA = according to risk assessment residue definition	STMR (mg/kg)	HR (mg/kg)	Unrounded OECD calculator MRL (mg/kg)	Current EU MRL (mg/kg) *	MRL compliance
Barley grain Wheat grain	EFSA, 2012	NEU, outdoor	GAP: 1x240 g flufenacet/ha E=RA 24 x <0.05	<0.05	<0.05	0.05	0.1	Yes
	EFSA, 2012	SEU, outdoor	Barley: 3 x <0.01; <0.05	0.01	0.05	0.1	0.1	Yes

			Wheat: 2 x <0.01; 0.01; <0.05, 0.05					
Oats grain Rye grain	EFSA, 2012	NEU, outdoor	24 x <0.05	0.05	0.05	0.05	0.05	Yes
Barley straw Wheat straw	EFSA, 2012	NEU, outdoor	< 0.01; 0.011; 18 x < 0.1	0.1	0.01	/	NA	NA
		SEU, outdoor	Barley: <0.05; 2 x 0.06; 0.11 Wheat: 3 x <0.05; 0.09; <0.10	0.06	0.11	/	NA	NA
Oats straw Rye straw	EFSA, 20212	NEU, outdoor	< 0.01; 0.011; 18 x < 0.1	0.01	0.1/	/	NA	NA

Table 7.3-9: Summary of new data supporting the intended uses of GLOB1310aH and conformity to existing MRL

Commodity	**Source**	**Residue zone (N-EU, S-EU, EU, outside EU)**	**Evaluation GAP Residue levels (mg/kg) E = according to enforcement residue definition RA = according to risk assessment residue definition**	**STMR (mg/kg)**	**HR (mg/kg)**	**Unrounded OECD calculator MRL (mg/kg)**	**Current EU MRL (mg/kg) ***	**MRL compliance**
Winter wheat	New trials (GLC2008, total 8 trials)	N-EU	GAP 1 x 120 g Flufenacet/ha, BBCH 14 Grain: E=RA: 2 x not detectable (< LOQ 0.01 mg/kg) 2 x not detectable (< LOD 0.003 mg/kg, set at 30% LOQ) 2 x 0.02 2 x 0.04 **Na-TFA-grain 0.58, 0.25, 0.31, 0.46, 0.48, 0.11, 0.44, 0.21	0.015 0.38	0.04 0.58	0.07 NA	0.1 NA	Yes NA

			Straw E=RA: 3 x <0.05 (< LOQ 0.05 mg/kg) 2 x <0.015 (< LOD 0.015 mg/kg, set at 30% LOQ) 1 x 0.11 1 x 0.08 1 x 0.06 **Na-TFA-straw 0.76, 0.21,0.58, 1.19, 0.76, 0.45, 0.74, 0.24	0.050 0.66	0.11 1.19	/ NA	NA NA	NA NA
	New trials, (GLC2009, total of 8 trials)	S-EU	GAP 1 x 120 g Flufenacet/ha, BBCH 14 Grain: E=RA: 2 x not detectable (< LOD 0.003 mg/kg, set at 30% LOQ) 3 x 0.02 1 x 0.016 2 x 0.01 (<LOQ 0.01 mg/kg) **Na-TFA-grain 0.12, 0.14, 0.30, 0.20, 0.38, 0.13, 0.22, 0.35	0.013 0.21	0.020 0.38	0.04 NA	0.1 NA	Yes NA
			Straw E=RA: 6 x <0.05 (< LOQ 0.05 mg/kg) 1 x <0.015 (< LOD 0.015 mg/kg, set at 30% LOQ) 1 x 0.06 **Na-TFA-straw 2x<0.2, 0.60, 0.59, 0.37, 0.60, 0.31, 0.76	0.050 0.46	0.060 0.76	/ NA	NA NA	NA NA

* Source of EU MRL: Reg. (EU) No. 1127/2014

** Na-TFA is not part of the current residue definition. However, detemrinations of this compound were done in the residue trials and are reported here for transparency sake.. This compound is reported as TFA-Na, because in the toxicity studies in the renewal report it is epxressed as this.

7.3.3.2 Effects on the residue level in pollen and bee products

Flufenacet is a systemic herbicide applied on winter cereals at pre-emergence and early post-emergence. Cereals are considered non-melliferous crop according to the SANTE/11956/2016 rev. 9. The application of GLOB1310aH is before the flowering stage and booting (BBCH≤14) in cereals. Therefore, only the exposure through non-target plants and succeeding crops are relevant.

Referring to a recent publication (Maynard *et al*. (2015)[2]), it was shown that less than 2% of all weeds recorded in arable crops (wheat, oilseed rape, sugarbeet, sunflower, potatoes, maize, peas and beans) are at flowering growth stage when herbicides are applied. It can therefore be considered that the exposure of bees to in-field flowering weeds resulting shortly after application of an herbicide is not a realistic scenario as flowering weeds are not present in the field in significant quantities in realistic conditions. Similarly, in arable crops, the weeds present during application of the herbicide and which are not yet at the flowering growth stage (< BBCH 60) will not survive cultural practices aimed at eliminating them (i.e. herbicidal treatments, GLOB1310aH is an herbicide itself) so that exposure will also not occur at significant level.

Three rotational crop residue studies performed in root, cereals and leafy vegetables were submitted by the notifier in the Monograph of Flufenacet (1997). The conclusions drawn in the monograph were later confirmed by the EFSA reasoned opinion on existing MRL (2012), a specific residue definition for rotational crops is not considered necessary as metabolism in primary and rotational crops was found to be similar and very low residue levels are expected. Considering that the application rate of flufenacet within the EU ranges between 0.15-0.6 kg a.s./ha it was concluded that flufenacet residue levels in rotational commodities are not expected to exceed 0.01 mg/kg. The application rate of flufenacet coming out from the use of GLOB1310aH is maximum 0.12 kg a.s./ha, thus residues levels in rotational crops are not expected to be higher than 0.01 mg/kg. It is clear that no high residues are expected in succeeding crops for the use of GLOB1310aH.

Additionally, in the 2019 European Union report on pesticide residues in food (approved on 25 February 2021, EFSA Journal 2021;19(4):6491) data show no flufenacet residues in samples of honey and other apicultural products analysed throughout Europe.

According to the recent technical guidance on residue and MRL setting in honey MRL (SANTE/11956/2016 rev. 9), if the highest residue (HR) found in aerial parts are below 0.05 mg/kg, no further residue studies in honey are necessary and the default MRL of 0.05 mg/kg can be set. In the case of flufenacet in cereal grains, HR is below 0.05 mg/kg (0.015mg/kg), therefore no further residue studies in honey are necessary and the default MRL of 0.05 mg/kg can be set. Nevertheless, it has to be highlighted that according to the Standing Committee on Plants, Animals, Food and Feed Section Phytopharmaceuticals – Residues 13 – 14 June 2019: "The Commission considered that a better overview of the situation would be first needed and will ask EFSA to extract recent national monitoring data on honey from the database. It emphasized that the Guidance Document was drafted with a view to keep data requirements to a minimum, and that it would in principle support pragmatic approach". Thus honey residues study is not required for non-target plants.

In conclusion, no exceedance of the default MRL in honey is expected based on the intended uses.

Comments of zRMS	On the basis of the available information, it should be concluded that there is no risk of flufenacet residues in bee products for the consumers.

[2] Maynard S.K., Albuquerque R., Weber C., von Mérey G., Geiger M.F., Becker R., Keppler J., Masche J., Brougham K, Coulson M., 1.8 Weeds in the treated field – a realistic scenario for pollinator risk assessment? Hazards of pestcides to bees – 12th International Symposium of the ICP-PR Bee Protection Group, Ghent (Belgium, September 15-17, 2014, Julius-Kühn-Archiv, 450, 2015.

7.3.3.3 Conclusion on the magnitude of residues in plants

The intended uses on winter cereals (pre-emergence) are adequately supported by the available data and considered acceptable.

The GAP for GLOB1310aH are considered to be covered by the critical EU GAP for flufenacet. The GAP in the new residue trials is the same as the intended GAP within this submission (highest intended dose of 120 g flufenacet/ha).

According to the '~~guideline on comparability, extrapolation, group tolerances and data requirements for setting MRLs', SANCO 7525/VI/95 rev 10.3 (June 2017),~~ technical guidelines on data requirements for setting maximum residue levels, comparability of residue trials and extrapolation of residue data on products from plant and animal origin (SANTE/2019/12752) extrapolation of residue data obtained from any of the crops (wheat, rye, barley, oats) for an active substance is possible if the use pattern involves treatments early in the growing season (last application before consumable parts of the crop have started to form). Therefore combined data sets obtained from residue studies on wheat, rye and barley are adequate to support uses for GLOB1310aH.

There are sufficient data to support the use of GLOB1310aH according to the intended GAP. The data submitted show that no exceedance of the current EU-MRL of 0.05 mg/kg (Regulation (EU) No. 1127/2014 will occur.

7.3.4 Magnitude of residues in livestock

7.3.4.1 Dietary burden calculation

Table 7.3-10: Input values for the dietary burden calculation (considering the uses evaluated in Art. 12 procedure and the uses under consideration)

Feed Commodity	Median dietary burden		Maximum dietary burden	
	Input value (mg/kg)	Comment	Input value (mg/kg)	Comment
Risk assessment residue definition = enforcement residue definition: Sum of all compounds containing the N fluorophenyl-N-isopropyl moiety expressed as flufenacet equivalent (EFSA Journal 2012;10(4):2689)				
Cereal grains/Crop seeds				
Cereal grain (barley, rye, wheat)	0.05	Median residue (EFSA, 2012)	0.05*	Median residue
Maize grain	0.05	Median residue (EFSA, 2012)	0.05*	Median residue
Soya bean	0.05	Median residue (EFSA, 2012)	0.05*	Median residue
Sunflower seed**	0.05	Median residue (EFSA, 2012)	0.05	Median residue
Forages				
Cereal bran**	0.4 x 8	Median residue x PF (EFSA, 2012)	0.4 x 8	Median residue x PF

Feed Commodity	Median dietary burden		Maximum dietary burden	
	Input value (mg/kg)	Comment	Input value (mg/kg)	Comment
Cereal straw (barley, rye wheat)	0.1	Median residue (EFSA, 2012)	0.11	Highest residue
Roots and Tubers				
Potatoes	0.05	Median residue (EFSA, 2012)	0.11	Highest residue
By-products				
Sunflower seed meal	0.1 x 2	Median residue x default PF (EFSA, 2012)	0.1 x 2***	Median residue x PF***
Soya bean meal	0.05	Median residue (EFSA, 2012)	0.05***	Median residue***
Soy bean hulls****	0.05	Median residue (EFSA, 2012)	0.05***	Median residue***
New feed items related to the dRR and not previously considered				
Cereals grain (triticale and oats)	0.05	Median residue (same input value as in EFSA, 2012, despite the applicant residue trials shwow a STMR of 0.15 mg/kg)	*	-
Cereals straw (triticale and oats)	0.1	Median residue (same input value as in EFSA, 2012, despite the applicant residue trials show a STMR of 0.05 mg/kg)	0.11	Highest residue (EFSA, 2012 and applicant residue trials)

*According to OECD animal model_2017, no HR is necessary for cereals/grains if no post-harvest treatment is indicated in the GAP. GLOB1310aH is not indicated for post-harvest treatment. Thus, HR was not included in the burden calculations.
** Cereal bran and Sunflower seed are non-EU feed items in the OECD animal model_2017 as this is an European registration Cereal Bran was not included in the burden calculations
***HR are not relevant for by-products according to OECD animal model_2017
****Soy bean hulls were not considered in the Art 12 review; however, in line to the current OECD animal model this by-product is included in the burden calculations

For sunflower seeds meal, for potato waste and potato dried pulp, no default processing factor was applied because flufenacet is applied early in the growing season and residues are expected to be below the LOQ. Concentration of residues in these commodities is therefore not expected.

The dietary burden calculation using Animal model 2017.

New data requirements	Regulation (EU) No 283/2013)							
Relevant groups	**Dietary burden expressed in**				**Most critical diet (a)**	**Most critical commodity (b)**		Trigger exceeded (Yes/No)
	mg/kg bw per day		mg/kg DM					0.004
	Median	Maximum	Median	Maximum				mg/kg bw
Cattle (all diets)	0,100	0,100	3,43	3,43	Dairy cattle	Potato	process waste	Yes
Cattle (dairy only)	0,100	0,100	2,60	2,60	Dairy cattle	Potato	process waste	Yes
Sheep (all diets)	0,114	0,114	3,43	3,43	Ram/Ewe	Potato	process waste	Yes
Sheep (ewe only)	0,114	0,114	3,43	3,43	Ram/Ewe	Potato	process waste	Yes
Swine (all diets)	0,042	0,042	1,81	1,81	Swine (breeding)	Potato	process waste	Yes
Poultry (all diets)	0,035	0,035	0,50	0,50	Poultry broiler	Potato	dried pulp	Yes
Poultry (layer only)	0,027	0,027	0,39	0,39	Poultry layer	Potato	dried pulp	Yes

Table 7.3-11: Results of the dietary burden calculation

Animal species	Median dietary burden (mg/kg bw/d)	Maximum dietary burden (mg/kg bw/d)	Highest contributing commodity	Max dietary burden (mg/kg DM)	Trigger exceeded (Y/N)
Risk assessment residue definition = enforcement residue definition: Sum of all compounds containing the N fluorophenyl-N-isopropyl moiety expressed as flufenacet equivalent (EFSA Journal 2012;10(4):2689)					
Cattle beef	0.0826	0.085	Potato process waste	3.54	Yes
Cattle dairy	0.1006	0.104	Potato process waste	2.71	Yes
Sheep Ram/Ewe	0.1147	0.118	Potato process waste	3.5	Yes
Sheep Lamb	0.0758	0.079	Potato process waste	1.85	Yes
Swine breeding	0.042	0.045	Potato process waste	1.96	Yes
Swine Finishing	0.017	0.022	Potato dried pulp	0.72	Yes
Poultry Broiler	0.035	0.037	Potato dried pulp	0.53	Yes
Poultry Layer	0.027	0.029	Potato dreid pulp	0.43	Yes
Poultry Turkey	0.012	0.016	Potato culls	0.22	Yes

* These categories correspond to those (formerly) assessed at EU level.

7.3.4.2 Livestock feeding studies (KCA 6.4.1-6.4.3)

Available data

In the EU peer review the dietary burden for livestock was assessed based on uses in cereals, corn, sunflower and soybean as relevant feeding items. Since no residues above the LOQ (0.05 mg/kg in green material of plants (at forage stage), cereal grain, sunflower and soybean seed, maize kernel and 0.1 mg/kg in straw) were determined and the data from metabolism studies do not indicate a significant transfer from residues in feeding items to food of animal origin, it was concluded in the Monograph that livestock feeding studies are not required. However, a cow feeding study conducted for the US was submitted and

has been evaluated. In this study, cows were administered highly exaggerated doses of FOE5043-oxalate which constitutes the main plant metabolite. The results show that even at an exaggerated dose of 7.8 ppm (1N dose in the study) no flufenacet derived residues can be expected in tissues or products of ruminants which have been fed flufenacet treated crops.

On the basis of the animal metabolism studies EFSA review of MRLs for flufenacet (2012) concluded that, after exposure to the maximum dietary burden (about 200 times lower than the dose level in the metabolism studies, residue levels in livestock commodities are expected to remain below the enforcement LOQ of 0.01 mg/kg in milk, 0.02 mg/kg in liver and 0.05 mg/kg in fat, eggs, kidney and muscle. Hence, no livestock feeding study is needed; MRLs and risk assessment values for the relevant commodities in ruminants, pigs and poultry can be established at the LOQ level.

A feeding study on dairy cattle was however carried out in the US in accordance with US EPA guidance and this study was considered in the peer review. Since parent flufenacet is not generally seen in plant matrices the study was performed using flufenacet oxalate as a representative metabolite. The results of the study show that no detectable residues of flufenacet oxalate are to be expected in products of animal origin which have been fed crops treated with flufenacet according to the GAP submitted for Article 12 (2012) (240 g flufenacet/ha). This conclusion was based on a dose level of 0.555 mg/kg bw/d, approximately 40 times the calculated maximum dietary burden in meat ruminants in EFSA, 2012 (0.0135 and 0.0238 mg/kg bw/d for dairy ruminants and dairy ruminants respectively).

Laying hens were dosed with 5 mg/kg bw/d of fluorophenyl-U-^{14}C and thiadiazole-2-^{14}C labelled flufenacet, corresponding to approximately 350 times the maximum exposure of poultry. These studies demonstrate that transfer of residues to eggs and tissues is relatively low at this high dose rate. The highest residue levels were found in liver (1.4 and 10.4 mg eq./kg respectively), levels in eggs were lower (0.2 and 0.8 mg eq./kg respectively). Since no parent compound was found in feed commodities an additional poultry metabolism study was performed using a representative metabolite (flufenacet oxalate). Laying hens were also dosed with 5 mg/kg bw/d of flufenacet oxalate, corresponding to approximately 350 times the exposure of poultry. This study also demonstrates that transfer of residues to eggs and tissues is relatively low, even at this high dose rate. The highest residue levels were found in liver (0.18 mg eq./kg), levels in eggs were lower (0.011 mg eq./kg) (EFSA, 2012).

Conclusion on the feeding studies

On the basis of the animal metabolism studies in the EU review of flufenacet it is concluded that, after exposure to the maximum dietary burden (about 200 times lower than the dose level in the metabolism studies), residue levels in livestock commodities are expected to remain below the LOQ.

Hence, no livestock feeding study is needed and MRLs and risk assessment values for the relevant commodities in ruminants and poultry can be established at the LOQ level.

The dietary burden arising from the supported uses on winter cereals has been evaluated by EFSA (2012) for use pattern at higher dose rates (240 g flufenacet/ha). The conclusions drawn in the EFSA Reasoned Opinion (EFSA, 2012) are still valid and no new data are required. These conclusions applied for the requested uses of GLOB1914aH, the GAP of this formulation (i.e. max. dose of 120 g flufenacet/ha) is considered to be covered by the EU evaluation. There is no risk that the MRLs set at the LOQ level in Reg. (EC) 1127/2014 will be exceeded.

Comments of zRMS	On the basis of the animal metabolism studies it is concluded that, after exposure to the maximum dietary burden, residue levels in livestock commodities are expected to remain below the LOQ. No livestock feeding study is needed.

7.3.5 Magnitude of residues in processed commodities (Industrial Processing and/or Household Preparation) (KCA 6.5.2-6.5.3)

Available data

No new data were submitted in the framework of this application.

For the representative uses in the flufenacet DAR, no significant or no analytically determinable residues occurred in the plant or plant product which would be processed. Therefore, no processing studies were triggered and hence considered processing of winter cereals treated at the proposed GAP with GLOB1310aH is not required.

Despite the low residue levels seen in crops considered in the DAR, two processing studies, one in maize and one in soybean, performed in the US were submitted during the EU review. In the field part of both GLP conform studies, the herbicide was applied as a single pre-emergence treatment at a rate of 4.9 kg ai/ha. This represents about 8 x the recommended rate in Europe. The tested procedures included wet and dry milling (tested commodities starch, crude oil and refined-bleached-deodorized oil for wet milling and germs, grits, meal, flour, crude oil and refined-bleached-deodorized oil for dry milling). It was demonstrated that no concentration occurs in the investigated commodities meal, hulls, crude oil and refined bleached deodorized oil. The results show that even then no residues of flufenacet above the LOQ were determined in either the RACs or the processed products.

Conclusions

Since the threshold of 0.1 g/kg is not exceeded in all the residue trials on small grain cereals and the ADI or ARfD is not exhausted by more than 10% studies on the magnitude of the residues in processed cereal grain are not necessary and no new data are included in this submission.

Comments of zRMS	Studies investigating the magnitude of residues in processed commodities show that, at the exaggerated dose rates, residues of flufenacet are below the LOQ in both the RACs and the processed products and no concentration of flufenacet was observed.

7.3.6 Magnitude of residues in representative succeeding crops

The crop under consideration can be grown in rotation. According to the evaluation in the Monograph (1997) and by EFSA (2012), in principle, no field rotational crop trials with flufenacet are deemed necessary to support the critical GAP of flufenacet in small grain cereals (0.24 kg a.s./ha). A study showed that metabolism in primary and rotational crops is comparable and significant residues in rotational crops are not expected, provided that flufenacet is applied according to the GAPs supported in the EU review/DAR of flufenacet, which is the case of GLOB1310aH (max. application rate of 120 g flufenacet/ha)

Based on EU residue data, processing studies were not considered necessary for all the evaluated crops since residue levels for all edible commodities were below the threshold of 0.1 mg/kg (Monograph France 1997; EFSA 2012).

Conclusions

The supported application rate with GLOB1310aH in winter cereals is lower compared to the application rate investigated in the field rotational crop studies (0.12 vs. 0.24 kg flufenacet/ha). Therefore, the use supported in the present dossier is covered by the reported data. The rotational crop study demonstrated that treatment of the preceding crop with a flufenacet containing product at the maximum field rate of 0.6 kg a.s./ha does not result in residues in/on cereals when grown as succeeding crops.

Comments of zRMS	Following the application rate of flufenacet within the EU ranges between 0.15-0.6 kg a.s./ha it can be concluded that flufenacet residue levels in rotational commodities are not expected to exceed 0.01 mg/kg (EFSA, 2012)

7.3.7 Other / special studies (KCA6.10, 6.10.1)

The available data for the active substance sufficiently address aspects of the residue situation that might arise from the use of GLOB1310aH. Therefore, other special studies are not needed.

7.3.8 Estimation of exposure through diet and other means (KCA 6.9)

Toxicological reference values relevant for dietary risk assessment are reported in the summary of the evaluation (see 0).

7.3.8.1 Input values for the consumer risk assessment

Consumer risk assessment calculations were performed taking into account all the crops for which an MRL has been set for flufenacet under EU Regulation No. 1127/2014. Where the MRL for a particular crop is below the LOQ, calculations have been made with the LOQ for that crop. The EFSA PRIMo Rev. 3.1 was used for the calculations.

The calculation of the TMDI was performed based on the EU MRLs for flufenacet laid down in Regulation (EU) No 1127/2014. The input value for the acute consumer exposure calculation for the crops under consideration (wheat, barley, oat, rye) is also included. The acute exposure calculation is performed for the crops under consideration taking into account the highest residue level observed in the new residue trials submitted in this dossier (0.11 mg/kg) as well as for commodities of animal origin (MRLs corresponding to the LOQs of the analytical method according to Reg. (EU) No. 1127/2014.

Table 7.3-12: Input values for the consumer risk assessment

Commodity	**Chronic risk assessment** **Acute risk assessment**	
	Input value (mg/kg)	**Comment**
Risk assessment residue definition: sum of all compounds containing the N fluorophenyl-N-isopropyl moiety expressed as flufenacet		
All commodities	MRL	Reg. (EU) No. 1127/2014

7.3.8.2 Conclusion on consumer risk assessment

Extensive calculation sheets are presented in 0.

Table 7.3-13: Consumer risk assessment

TMDI (% ADI) according to EFSA PRIMo	88% (NL toddler, potatoes)
IEDI (% ADI) according to EFSA PRIMo	No IEDI calculations were performed as the TMDI calculations using the MRLs were already acceptable. No refinement of the chronic risk assessment is required.

IESTI (% ARfD) according to EFSA PRIMo*	Raw commodity: 9% wheat (children) 5% wheat (adults) Processed commodity: 8% wheat/milling flour (children) 5% barley/bear (adults)
NTMDI (% ADI) **	No NTMDI model available.
NEDI (% ADI)**	No NEDI model available.

* include raw and processed commodities if both values are required for PRIMo
** if national model is available

Moreover, the proposed uses of GLOB1310aH is covered by the GAP reviewed at Art 12 of flufenacet (EFSA, 2012). In this document it was concluded an acceptable risk assessment, acute and chronic, to consumers. Thus, the conclusion is extensive to GLOB1310aH.

The proposed uses of flufenacet in the formulation GLOB1310aH do not represent unacceptable chronic and acute risk for the consumer.

Regarding Na-TFA, this compound is not part of the residue definition of flufenacet. However, for transparency sake the consumer risk assessment was performed as well using EFSA Primo calculator Rev. 3.1. Because the residues of Na-TFA were only analysed in wheat, the calculations were done using the refined option, namely only the intended GAP. Moreover, since cereals treated with GLOB1310aH can be fed to animals, the anticipated TFA-Na residue levels in animal commodities reported in the table 2.7.9-5 of Volume 1 of the RAR Flufenacet 2017 were used as input values too. The Adi and ARfD values used for the calculations were those reported in the RAR flufenacet 2017, namely 0.05 mg/kg bw/d and 0.75 mg/kg bw/d, respectively. The highest TDI was 6.71% of ADI for NL toddler due to milk cattle. The IESTI for processed commodities was 0.6% wheat/milling fluor for children and 0.4% barley/beer in adults. The IESTI for raw commodities was 1% milk for children and 0.4% wheat in adults. Moreover, it has to be highlighted that in the RAR Flufenacet 2017, an acceptable risk to the consumer was found a residue value of 0.759 mg/kg, while in the new trials conducted with GLOB1310aH the highest residue level was 0.58 mg/kg. Therefore, the risk assessment of GLOB1310aH it is covered by that in the RAR.

Comments of zRMS	The estimated long-term dietary intake is below the ADI. The diet with the highest TMDI is NL toddler population with 88% of ADI. For this diet, the highest contributor is potato with 13% of ADI. The highest calculation of IESTI is for consumption wheat in children and adults (9% and 5% of ARfD respectively) and milling flour and barley bear (8% and 5% of ARfD respectively for children and adults). The proposed use of flufenacet in the formulation GLOB1310aH does not represent unacceptable chronic or acute risks for the consumer.

7.4 Combined exposure and risk assessment

From a scientific point of view it is regarded necessary to take into account potential combination effects. However, the evaluation of cumulative or synergistic effects as requested by Art. 4 (3b) of Regulation (EC) No. 1107/2009 should only be performed when harmonised "scientific methods accepted by the Authority to assess such effects are available."

Currently, no EU-harmonized guidance is available on the risk assessment of combined exposure to multiple active substances; this approach is not mandatory at EU level.

7.4.1 Acute consumer risk assessment from combined exposure

Please refer to the rationale given under Point 7.4. Also, the product is a mixture of two active substances, but for only flufenacet has an acute reference dose been allocated. Thus an acute consumer risk assessment from combined exposure is not necessary.

7.4.2 Chronic consumer risk assessment from combined exposure

The uses under consideration provide only a minor contribution to the overall chronic exposure of consumers to pesticide residues. The issue requires a more universal consideration and possibly the generic usage of monitoring data. A harmonised approach is not yet available, and currently no specific consideration is warranted in the scope of this evaluation.

7.5 References

Aclonifen

-"DAR (Germany), 2006":
Germany, 2006. Draft assessment report on the active substance aclonifen prepared by the rapporteur Member State Germany in the framework of Council Directive 91/414/EEC, August 2006.

-"Addendum DAR (Germany), 2008"
Germany, 2008. Final addendum to the draft assessment report on the active substance aclonifen, compiled by EFSA, June 2008.

-"EFSA 2008":
EFSA (European Food Safety Authority), 2008. Conclusion regarding the peer review of the pesticide risk assessment of the active substance Aclonifen. EFSA Scientific Report (2008) 149, 1-80.

-"EFSA Journal, 2015":
EFSA (European Food Safety Authority), 2015. Reasoned opinion on the review of the existing maximum residue levels (MRLs) for aclonifen according to Article 12 of Regulation (EC) No 396/2005. EFSA Journal 2015;13(11):4323.
Evaluation of confirmatory data following the Article 12 MRL review for aclonifen. EFSA Journal 2020;18(5):6102

-"Evaluation report (ER), Germany, 2011":
Germany, 2011. Evaluation report prepared under the review Article 12 of Regulation (EC) No 396/2005. Review of the existing MRLs for aclonifen, June 2011.

Flufenacet

-"France, 1997":
Draft assessment report on the active substance flufenacet prepared by the rapporteur Member State France in the framework of Council Directive 91/414/EEC, August 1997.

-"France, 2002":
Addendum to the draft assessment report on the active substance flufenacet prepared by the rapporteur Member State France in the framework of Council Directive 91/414/EEC, November 2002

-"EFSA Journal, 2012":
Reasoned opinion on the review of the existing maximum residue levels (MRLs) for flufenacet according to Article 12 of Regulation (EC) No 396/2005. EFSA Journal 2012;10(4):2689.

Appendix 1 Lists of data considered in support of the evaluation

List of data submitted by the applicant and relied on

Data point	Author(s)	Year	**Title** **Company Report No.** **Source (where different from company)** **GLP or GEP status** **Published or not**	**Vertebrate study Y/N**	Owner
KCP 6.1 (filed in Part B5 KCP 5.2-01)	Winter, O., Graf, H.	2021	Validation of Analytical Methods for the Determination of Aclonifen in Different Matrices of Plant Origin. Study No. S0-07421 (GLC-2018V) Eurofins Agriscience Services, Germany. GLP Unpublished	N	Globachem NV
KCP 6.1 (filed in Part B5 KCP 5.2-02)	Winter, O., Amann, S.	2021	Validation of Analytical Methods for the Determination of Flufenacet in Different Matrices of Plant Origin. Study Report S20-09167 (GLC-2019V). Eurofins Agroscience Services, Germany GLP Unpublished	N	Globachem NV
KCA 6.3.1	Lakaschus, S. et al.	2021a	Determination of Residues of Aclonifen and Flufenacet and its metabolites in Winter Wheat Fiedl Samples (Grain and Straw) after Application of GLOB1310aH in Northern Europe in 2018-2019 Study No. S20-03945 (GLC-2008) Eurofins Agrosciences Services Chem GmbH GLP Unpublished	N	Globachem NV
KCA 6.3.1	Lakaschus, S. et al.	2021b	Determination of Residues of Aclonifen and Flufenacet and its metabolites in Winter Wheat Fiedl Samples (Grain and Straw) after Application of GLOB1310aH in Southern Europe in 2018-2019 Study No. S20-04012 (GLC-2009) Eurofins Agrosciences Services Chem GmbH GLP Unpublished	N	Globachem NV

List of data submitted or referred to by the applicant and relied on, but already evaluated at EU peer review

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
/	/	/	/	/	/

The following tables are to be completed by MS.

List of data submitted by the applicant and not relied on

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP XX	Author	YYYY	Title Company Report No Source GLP/non GLP/GEP/non GEP Published/Unpublished	Y/N	Owner

List of data relied on and not submitted by the applicant but necessary for evaluation

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP XX	Author	YYYY	Title Company Report No Source GLP/non GLP/GEP/non GEP Published/Unpublished	Y/N	Owner

Appendix 2 Detailed evaluation of the additional studies relied upon

A 2.1 Aclonifen

A 2.1.1 Stability of residues

A 2.1.1.1 Stability of residues during storage of samples

A 2.1.1.1.1 Storage stability of residues in plant products

A 2.1.1.1.1.1 Study 1

Comments of zRMS:	The study was performed according to guideline and GLP requirements, without deviations. The results of the study are adequately reported. The study is considered acceptable. The zRMS agrees with the conclusions provided by the applicant regarding storage stability of aclonifen.

Reference:	KCP 6.1
Report	Validation of Analytical Methods for the Determination of Aclonifen in Different Matrices of Plant Origin. Winter, O., and Graf, H. 2021. S0-07421 (GLC-2018V). Eurofins Agriscience Services, Germany.
Guideline(s):	Yes, SANCO/3029/99 rev. 4, SANCO/825/00 rev 8.1
Deviations:	No
GLP:	Yes
Acceptability:	Yes

Here below only the part corresponding to stability in analytes in sample extracts is presented, as this is relevant for the residue section. A full summary is to be found in section B7 within this dossier.

Materials and methods

In brief, samples of wheat (green plant, grain and straw) were extracted with acetonitrile/water (4/1, v/v). The extracts were cleaned by centrifugation and filtration.

Following the first analysis, the final extracts of fortified samples together with two (2) control sample extract were stored at typically 1 °C to 10 °C in the dark for 21 - 24 days. After this period, the final extracts were re-analysed against freshly prepared calibration standards. One (1) mass transition was evaluated. The results obtained are summarised in the table below.

Results and discussions

Matrix	Fortification level	Mean recovery 1st injection	Rel. Std. Dev. 1st injection (n=10)	Mean recovery 2nd injection	Rel. Std. Dev. 2nd injection (n=10)	Days of storage (1st to 2nd injection)	Difference (%) of recoveries after stor-

		(n=10) (%)	(%)	(n=10) (%)	(%)		age to recoveries before storage
Wheat (green plant)	0.01/0.1	88	5.0	87	4.1	24	-1
Wheat (grain)	0.01/0.1	89	2.9	98	3.0	22	9
Wheat (straw)	0.01/0.1	74	2.7	76	3.7	21	2

The mean recovery value(s) of the re-analysed extracts were in the range of 70 - 120 % and within ± 20 % of the original result. Therefore, extracts are considered to be stable when stored at 1 °C to 10 °C for at least 21 days in the dark.

Conclusion

Aclonifen was found to be stable in final extracts of all matrices at least 22 days when stored at typically 1 °C to 10 °C in the dark.

A 2.1.1.1.2 Storage stability of residues in animal products

No new studies submitted.

A 2.1.2 Nature of residues in plants, livestock and processed commodities

No new studies submitted.

A 2.1.3 Magnitude of residues in plants

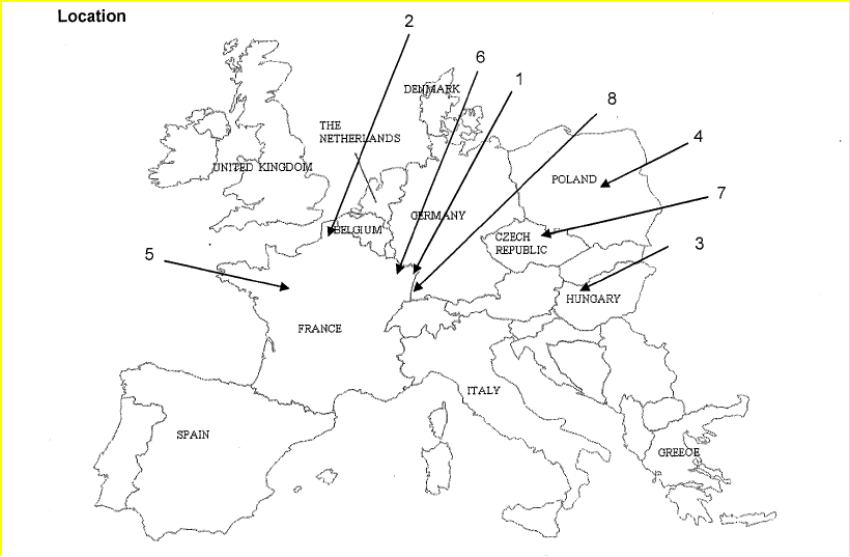
A 2.1.3.1 Winter wheat

Table A 1: Comparison of intended and critical EU GAPs

Type of GAP	Number of applications	Application rate per treatment (precise unit)	Interval between application	Growth stage at last application	PHI (days)
cGAP EU (DAR, RMS, year)	Not evaluated				
cGAP EU (Art. 12, EFSA, year)	Not evaluated				
Intended cGAP (4*)	1	1080 g/ha	-	BBCH ~~10-14~~-00-09	n.a.**

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0
** n.a. The PHI is covered by the vegetation period of the crop (autumn application)

The location of studies on residues of aclonifen and flufenacet is presented in the figure below.



A 2.1.3.1.1 Study 1 – S20-03945 (GLC-2008)

Comments of zRMS:	The study was carried out according to GLP requirements and relevant guidelines. The stability of the analyte in the final extracts of wheat (grain and straw) upon storage at typically 1 °C to 10 °C for at least 21 days was demonstrated. Aclonifen was applied once at a rate ranged between 1033-1159 g a.s./ha, at BBCH 13-14. The intended GAP is within 810-1080 g a.s./ha at BBCH 00-09). Thus, the intended GAP is within/less critical than this evaluated in the study. All residues were well below the current MRL for cereals of 0.01 mg/kg. The proposed use of aclonifen in the formulated product is accepted.

Reference:	KCP 6.3.1.1-01
Report	Determination of Residues of Aclonifen and Flufenacet and its metabolites in Winter Wheat Field Samples (Grain and straw) after application of GLOB1310aH in Northern Europe in 2018-2019. Lakaschus, S., Winter, O., Reinhardt, R., Nachtigall, S., Kiraly, S. 2021. Study report S20-03945 (GLC-2008). Eurofins Agrisciences Services, Germany.
Guideline(s):	Yes (OECD ENV/JM/MONO(2007)17, SANCO/3029/99 rev4., SANCO/825/00 rev. 8.1 (After the experimental end of this study the new guideline SANTE/2020/12830, Rev.1, which supersedes guidelines SANCO/825/00, rev. 8.1 and SANCO/3029/99 rev. 4, was published. The validation data obtained within this study are mostly compatible with the new guideline)
Deviations:	No
GLP:	Yes
Acceptability:	Yes

Table A 2: Summary of the study 1 trials – S20-03945 (GLC-2008)

Trial No./ Location/ EU zone/ Year	Commodity/ Variety	Date of 1.Sowing or plant-ing 2.Harvest	Application rate per treatment			Dates of treat-ment or no. of treatments and last date	Growth stage at last treat-ment or date	Portion analyzed	Residues (mg/kg)	PHI (days)	Details on trial
			g a.s./ ha Aclonifen	Water (l/ha)	g a.s./hl Aclonifen				Aclonifen		
	(a)	(b)				(c)				(d)	(e)

Trial No./ Location/ EU zone/ Year	Commodity/ Variety	Date of 1.Sowing or planting 2.Harvest	Application rate per treatment			Dates of treatment or no. of treatments and last date	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg)	PHI (days)	Details on trial
			g a.s./ ha Aclonifen	Water (l/ha)	g a.s./hl Aclonifen				Aclonifen		
	(a)	(b)				(c)				(d)	(e)
Trial B8273 AN1 France Northern Zone	Winter wheat Absalon	13/10/2018 08/07/2019	1087.2	302	359.93	29/11/2018	BBCH 13-14	Grain Straw	<0.003 n.d. <0.003 n.d.	DAA 221	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8273 ND1 France Northern Zone	Winter wheat Bodecor	09/11/2018 01/08/2019	1087.2	302	359.93	27/02/2019	BBCH 14	Grain Straw	<0.003 n.d. <0.003 n.d.	DAA 155	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8273 HU1 Hungary Northern Zone	Winter wheat GK Csillag	11/10/2018 16/07/2019	1033.2	287	360	16/11/2018	BBCH 14	Grain Straw	<0.003 n.d. <0.003 n.d.	DAA 242	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8273 PL1 Poland Northern Zone	Winter wheat Banderola	02/10/2018 25/07/2019	1159.2	322	362.2	12/11/2018	BBCH 14	Grain Straw	<0.003 n.d. <0.01	DAA 255	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8273 BM1 France Northern Zone	Winter wheat Boregar	27/10/2018 10/07/2019	1054.8	293	360	11/01/2019	BBCH 14	Grain Straw	<0.003 n.d. <0.003 n.d.	DAA 180	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8273 MA1 France Northern Zone	Winter wheat Boregar	02/10/2018 07/07/2019	1065.6	296	360	29/11/2018	BBCH 14	Grain Straw	<0.003 n.d. <0.003 n.d.	DAA 230	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8273 CZ1 Czech Republic Northern Zone	Winter wheat Herman	27/09/2018 24/07/2019	1101.6	306	360	09/11/2018	BBCH 14	Grain Straw	<0.003 n.d. <0.003 n.d.	DAA 257	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8273 BW1	Winter wheat	22/10/2018	1065.6	296	360	14/02/2019	BBCH 14	Grain	<0.003 n.d.	DAA	residues of aclonifen

Trial No./ Location/ EU zone/ Year	Commodity/ Variety	Date of 1.Sowing or planting 2.Harvest	Application rate per treatment			Dates of treatment or no. of treatments and last date	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg)	PHI (days)	Details on trial
			g a.s./ ha Aclonifen	Water (l/ha)	g a.s./hl Aclonifen				Aclonifen		
	(a)	(b)				(c)				(d)	(e)
Germany Northern Zone	Casario	05/07/2019						Straw	<0.003 n.d.	141	according to the analytical method BAG 00950/M002 as validated in S20-07421

(a) According to CODEX Classification / Guide
(b) Only if relevant
(c) Year must be indicated
(d) Days after last application (Label pre-harvest interval, PHI, underline)
(e) Remarks may include: Climatic conditions; Reference to analytical method and information which metabolites are included

A 2.1.3.1.2 Study 2 – S20-04012(GLC-2009)

Comments of zRMS:	The study was carried out according to GLP requirements and relevant guidelines. Aclonifen was applied once at a rate ranged between 1196-1130 g a.s./ha, at BBCH 14. The intended GAP is within 810-1080 g a.s./ha at BBCH 00-09). Thus, the intended GAP is less critical than this evaluated in the study. All residues were well below the current MRL for cereals of 0.01 mg/kg. The proposed use of aclonifen in the formulated product is accepted.

Reference:	KCP 6.3.1.1-02
Report	Determination of Residues of Aclonifen and Flufenacet and its metabolites in Winter Wheat Field Samples (Grain and straw) after application of GLOB1310aH in Southern Europe in 2018-2019. Lakaschus, S., Reinhardt, R., Nachtigall. 2021. Study report S20-04012 (GLC-2009). Eurofins Agrisciences Services, Germany.
Guideline(s):	Yes (OECD ENV/JM/MONO(2007)17, SANCO/3029/99 rev4., SANCO/825/00 rev. 8.1 (After the experimental end of this study the new guideline SANTE/2020/12830, Rev.1, which supersedes guidelines SANCO/825/00, rev. 8.1 and SANCO/3029/99 rev. 4, was published. The validation data obtained within this study are mostly compatible with the new guideline)
Deviations:	No

GLP: Yes

Acceptability: Yes

Table A 3: Summary of the study 1 trials – S20-04012 (GLC-2009)

Trial No./ Location/ EU zone/ Year	Commodity/ Variety	Date of 1.Sowing or planting 2. Harvest	Application rate per treatment			Dates of treatment or no. of treatments and last date	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg)	PHI (days)	Details on trial
			g a.s./ ha Aclonifen	Water (l/ha)	g a.s./hl Aclonifen				Aclonifen		
	(a)	(b)				(c)				(d)	(e)

Trial No./ Location/ EU zone/ Year	Commodity/ Variety	Date of 1.Sowing or planting 2. Harvest	Application rate per treatment			Dates of treatment or no. of treatments and last date	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg)	PHI (days)	Details on trial
			g a.s./ ha Aclonifen	Water (l/ha)	g a.s./hl Aclonifen				Aclonifen		
	(a)	(b)				(c)				(d)	(e)
Trial B8274 AV1 France Southern Zone	Winter wheat Miradoux	22/10/2018 01/07/2019	1119.6	311	360	07/02/2019	BBCH 14	Grain Straw	<0.003 n.d. <0.01	DAA 144	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8274 BA1 Italy Southern Zone	Winter wheat Quadrato	12/12/2018 03/07/2019	1119.6	311	360	21/02/2019	BBCH 14	Grain Straw	<0.003 n.d. 0.02	DAA 132	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8274 EF1 France Southern Zone	Winter wheat Oregrain	26/10/2018 09/07/2019	1184.4	329	360	10/12/2018	BBCH 14	Grain Straw	<0.003 n.d. <0.003 n.d.	DAA 211	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8274 GR1 Greece Southern Zone	Winter wheat Levante	28/12/2018 08/07/2019	1188.0	330	360	18/03/2019	BBCH 14	Grain Straw	<0.003 n.d. <0.01	DAA 112	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8274 TL1 France Southern Zone	Winter wheat Venezio	25/10/2018 04/07/2019	1126.8	313	360	04/02/2019	BBCH 14	Grain Straw	<0.003 n.d. <0.003 n.d.	DAA 150	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8274 ES1 Spain Southern Zone	Winter wheat Bonifacio	20/12/2018 11/07/2019	1130.4	314	360	18/03/2019	BBCH 14	Grain Straw	<0.003 n.d. 0.05	DAA 115	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8274 GR2 Greece Southern Zone	Winter wheat Marco Aurelio	25/11/2018 21/06/2019	1116.0	310	360	15/02/2019	BBCH 14	Grain Straw	<0.003 n.d. <0.01	DAA 126	residues of aclonifen according to the analytical method BAG 00950/M002 as validated in S20-07421
Trial B8274 IT1	Winter wheat	20/10/2018	1126.8	313	360	26/11/2018	BBCH 14	Grain	<0.003 n.d.	DAA	residues of aclonifen

Trial No./ Location/ EU zone/ Year	Commodity/ Variety	Date of 1.Sowing or planting 2. Harvest	Application rate per treatment			Dates of treatment or no. of treatments and last date	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg)	PHI (days)	Details on trial
			g a.s./ ha Aclonifen	Water (l/ha)	g a.s./hl Aclonifen				Aclonifen		
	(a)	(b)				(c)				(d)	(e)
Italy Southern Zone	Rebelde	27/06/2019						Straw	<0.003 n.d.	213	according to the analytical method BAG 00950/M002 as validated in S20-07421

(a) According to CODEX Classification / Guide
(b) Only if relevant
(c) Year must be indicated
(d) Days after last application (Label pre-harvest interval, PHI, underline)
(e) Remarks may include: Climatic conditions; Reference to analytical method and information which metabolites are included

A 2.1.4 Magnitude of residues in livestock

No new studies are submitted.

A 2.1.5 Magnitude of residues in processed commodities (Industrial Processing and/or Household Preparation)

No new studies are submitted.

A 2.1.6 Magnitude of residues in representative succeeding crops

No new studies are submitted.

A 2.1.7 Other/Special Studies

No new studies are submitted.

A 2.2 Flufenacet

A 2.2.1 Stability of residues

A 2.2.1.1 Stability of residues during storage of samples

A 2.2.1.1.1 Storage stability of residues in plant products

A 2.2.1.1.1.1 Study 1

Comments of zRMS:	The study was performed according to guideline and GLP requirements, without deviations. The results of the study are adequately reported. The study is considered acceptable. The zRMS agrees with the conclusions provided by the applicant regarding storage stability of flufenacet.

Reference:	KCP 6.1
Report	Validation of Analytical Methods for the Determination of Flufenacet in Different Matrices of Plant Origin. Winter, O., Amann, S., 2021. Report S20-09167 (GLC-2019V). Eurofins Agroscience Services, Germany
Guideline(s):	Yes, SANCO/3029/99 rev. 4, SANCO/825/00 rev 8.1

Deviations: No

GLP: Yes

Acceptability: Yes

Here below only the part corresponding to stability in analytes in sample extracts is presented, as this is relevant for the residue section. A full summary is to be found in section B7 within this dossier.

Materials and methods

In brief, samples of wheat (grain and straw) were extracted with water followed by oxidation with potassium permanganate and hydrolysis with sulphuric acid. Thereafter, the residues were purified by water steam distillation of the formed common moiety compound 4-Fluoro-N-isopropylaniline (FOE 5043-aniline).

Following the first analysis, the final extracts of samples fortified at the LOQ level and 10x LOQ level together with two (2) control sample extracts were stored at typically 1 °C to 9 °C in the dark for at least 10 days. After this period, the final extracts were re-analysed against freshly prepared calibration standards. One (1) mass transition was evaluated. The results obtained are summarised in the tables below.

Results and discussions

Matrix	Fortification level (mg/kg)	Mean recovery 1st Injection (n = 5) (%)	Rel. Std. Dev. 1st injection (n = 5) (%)	Mean recovery 2nd Injection (n = 5) (%)	Rel. Std. Dev. 2nd injection (n = 5) (%)	Days of storage (1st to 2nd Injection)	Difference (in %) of recoveries after storage to recoveries before storage in %
Flufenacet (fortified with flufenacet)							
Wheat (grain) (*m/z* 154→95)	0.01	97	3.8	83	3.4	12	-14
	0.1	95	7.2	89	2.8	12	-6
Wheat (straw) (*m/z* 154→95)	0.05	92	3.2	88	4.5	11	-4
	0.5	86	2.5	87	2.7	11	+1

Fortified with flufenacet, determined as FOE 5043-aniline and calculated as flufenacet.

Matrix	Fortification level (mg/kg)	Mean recovery 1st Injection (n = 5) (%)	Rel. Std. Dev. 1st injection (n = 5) (%)	Mean recovery 2nd Injection (n = 5) (%)	Rel. Std. Dev. 2nd injection (n = 5) (%)	Days of storage (1st to 2nd Injection)	Difference (in %) of recoveries after storage to recoveries before storage in %
Flufenacet (fortified with a mixture of metabolites)							
Wheat (grain) (*m/z* 154→95)	0.01	71	1.7	76	1.2	19	+5
	0.1	71	3.6	67	3.7	19	-4
Wheat (straw) (*m/z* 154→95)	0.05	71	2.7	77	2.6	10	+6
	0.5	71	1.0	72	1.9	10	+1

Fortified with a mixture of flufenacet metabolites (flufenacet-oxalate (M1), flufenacet sulfonic acid sodium salt (M2), flufenacet-thioglycolate sulfoxide (M4), FOE Cysteine (M23) in a molar ratio 1/1/1/1, expressed as parent equivalents), determined as FOE 5043-aniline and calculated as total residue of flufenacet.

The mean recovery values of the re-analysed extracts were in the range of 70 - 120 % and within ± 20 %

of the original result, except for wheat (grain) where the recoveries of the 10x LOQ fortified with the flufenacet metabolites declined to 67 %. As this is still within ± 20 % of the original result (71 %), the extracts are nevertheless considered stable.

Conclusion

All extracts are considered stable when stored at 1 °C to 9 °C for at least 10 days in the dark.

A 2.2.2 Magnitude of residues in plants

A 2.2.2.1 Winter wheat

Table A 4: Comparison of intended and critical EU GAPs

Type of GAP	Number of applications	Application rate per treatment (precise unit)	Interval between application	Growth stage at last application	PHI (days)
cGAP EU (Monogreph France, 1997, Art 12. EFSA 2012)	1	240 g a.s./ha	-	Autumn early post emergence	n.a.**
cGAP EU (Art. 12, EFSA, 2012)	1	240 g a.s./ha	-	BBCH 13	n.a.**
Intended cGAP (4*)	1	~~120~~ 90-120 g/ha	-	BBCH ~~10-14~~ 00-09	n.a.**

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0
** n.a. The PHI is covered by the vegetation period of the crop (autumn application)

Comments of zRMS:	The study was carried out according to GLP requirements and relevant guidelines. The samples of winter wheat were analysed for residues of flufenacet and its metabolites flufenacet oxalate (M1), flufenacet sulfonic acid (M2), flufenacet-thioglycolate sulfoxide (M4) and FOE Cysteine (M23) calculated and expressed as total residue of flufenacet and for residues of TFA. TFA is not part of the current residue definition. However, determinations of this compound were done in the residue trials and are reported here for transparency sake. The data on the residues of TFA is included in the table 7.3.9. The stability of the analytes in the final extracts of wheat (grain and straw) upon storage at typically 1 °C to 10 °C for at least 10 days was demonstrated. Flufenacet was applied once at a rate ranged between 117-128 g a.s./ha, at BBCH 13-14. Flufenacet was also evaluated according to EU critical GAP: 1 x 240 g a.s./ha, at BBCH 13. The intended GAP of 90-120 g a.s./ha is less critical than this evaluated in the study. The residues were well below the current MRL for wheat of 0.1 mg/kg. The proposed use of flufenacet in the formulated product is accepted.

KCP 6.3.1.1-01

Reference:

Report — Determination of Residues of Aclonifen and Flufenacet and its metabolites in Winter Wheat Field Samples (Grain and straw) after application of GLOB1310aH in Northern Europe in 2018-2019. Lakaschus, S., Winter, O., Reinhardt, R., Nachtigall, S., Kiraly, S. 2021. Study report S20-03945

	(GLC-2008). Eurofins Agrisciences Services, Germany.
Guideline(s):	Yes (OECD ENV/JM/MONO(2007)17, SANCO/3029/99 rev4., SANCO/825/00 rev. 8.1 (After the experimental end of this study the new guideline SANTE/2020/12830, Rev.1, which supersedes guidelines SANCO/825/00, rev. 8.1 and SANCO/3029/99 rev. 4, was published. The validation data obtained within this study are mostly compatible with the new guideline)
Deviations:	No
GLP:	Yes
Acceptability:	Yes

Table A 5: Summary of the study 1 trials – S20-03945 (GLC-2008)

Trial No./ Location/ EU zone/ Year	Commodity/ Variety	Date of 1.Sowing or plant-ing 2.Harvest	Application rate per treatment			Dates of treat-ment or no. of treatments and last date	Growth stage at last treat-ment or date	Portion analyzed	Residues (mg/kg)	PHI (days)	Details on trial
			g a.s./ ha Flufenacet	Water (l/ha)	g a.s./hl Flufenacet				Total residue defi-nition		
	(a)	(b)				(c)				(d)	(e)

Trial No./ Location/ EU zone/ Year (a)	Commodity/ Variety (a)	Date of 1.Sowing or planting 2.Harvest (b)	Application rate per treatment: g a.s./ ha Flufenacet	Application rate per treatment: Water (l/ha)	Application rate per treatment: g a.s./hl Flufenacet	Dates of treatment or no. of treatments and last date (c)	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg): Total residue definition	PHI (days) (d)	Details on trial (e)
Trial B8273 AN1 France Northern Zone	Winter wheat Absalon	13/10/2018 08/07/2019	120.8	302	40	29/11/2018	BBCH 13-14	Grain Straw	<0.01 <0.05	DAA 221	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8273 ND1 France Northern Zone	Winter wheat Bodecor	09/11/2018 01/08/2019	120.8	302	40	27/02/2019	BBCH 14	Grain Straw	<0.003 n.d. <0.015 n.d.	DAA 155	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8273 HU1 Hungary Northern Zone	Winter wheat GK Csillag	11/10/2018 16/07/2019	114.8	287	40	16/11/2018	BBCH 14	Grain Straw	0.02 <0.05	DAA 242	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8273 PL1 Poland Northern Zone	Winter wheat Banderola	02/10/2018 25/07/2019	128.8	322	40	12/11/2018	BBCH 14	Grain Straw	0.04 0.11	DAA 255	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8273 BM1 France Northern Zone	Winter wheat Boregar	27/10/2018 10/07/2019	117.2	293	40	11/01/2019	BBCH 14	Grain Straw	0.01 <0.05	DAA 180	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8273 MA1 France Northern Zone	Winter wheat Boregar	02/10/2018 07/07/2019	118.4	296	40	29/11/2018	BBCH 14	Grain Straw	<0.003 n.d. <0.015 n.d.	DAA 230	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8273 CZ1 Czech Republic Northern Zone	Winter wheat Herman	27/09/2018 24/07/2019	122.4	306	40	09/11/2018	BBCH 14	Grain Straw	0.02 0.08	DAA 257	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8273 BW1	Winter wheat	22/10/2018	118.4	296	40	14/02/2019	BBCH 14	Grain	0.04	DAA	residues of flufenacet

Trial No./ Location/ EU zone/ Year (a)	Commodity/ Variety (a)	Date of 1.Sowing or planting 2.Harvest (b)	Application rate per treatment: g a.s./ ha Flufenacet	Application rate per treatment: Water (l/ha)	Application rate per treatment: g a.s./hl Flufenacet	Dates of treatment or no. of treatments and last date (c)	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg): Total residue definition	PHI (days) (d)	Details on trial (e)
Germany Northern Zone	Casario	05/07/2019						Straw	0.06	141	according to the analytical method BAG 01100/M002 as validated in S20-09167

(a) According to CODEX Classification / Guide
(b) Only if relevant
(c) Year must be indicated
(d) Days after last application (Label pre-harvest interval, PHI, underline)
(e) Remarks may include: Climatic conditions; Reference to analytical method and information which metabolites are included

A 2.2.2.1.1 Study 2 – S20-04012(GLC-2009)

Comments of zRMS:	The study was carried out according to GLP requirements and relevant guidelines. The stability of the analytes in the final extracts of wheat (grain and straw) upon storage at typically 1 °C to 10 °C for at least 10 days was demonstrated. Flufenacet was applied once at a rate ranged between 124-132 g a.s./ha, at BBCH 14. Flufenacet was also evaluated according to EU critical GAP: 1 x 240 g a.s./ha, at BBCH 13. The intended GAP of 90-120 g a.s./ha is less critical than this evaluated in the study. The residues were well below the current MRL for wheat of 0.1 mg/kg. The proposed use of flufenacet in the formulated product is accepted.

Reference: KCP 6.3.1.1-02

Report: Determination of Residues of Aclonifen and Flufenacet and its metabolites in Winter Wheat Field Samples (Grain and straw) after application of GLOB1310aH in Southern Europe in 2018-2019. Lakaschus, S., Reinhardt, R., Nachtigall. 2021. Study report S20-04012 (GLC-2009). Eurofins Agrisciences Services, Germany.

Guideline(s): Yes (OECD ENV/JM/MONO(2007)17, SANCO/3029/99 rev4., SANCO/825/00 rev. 8.1 (After the experimental end of this study the new guideline SANTE/2020/12830, Rev.1, which supersedes guidelines SANCO/825/00, rev. 8.1 and SANCO/3029/99 rev. 4, was published. The validation data obtained within this study are mostly compatible with the

new guideline)

Deviations: No

GLP: Yes

Acceptability: Yes

Table A 6: Summary of the study 1 trials – S20-04012 (GLC-2009)

Trial No./ Location/ EU zone/ Year	Commodity/ Variety	Date of 1.Sowing or planting 2. Harvest	Application rate per treatment			Dates of treatment or no. of treatments and last date	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg)	PHI (days)	Details on trial
			g a.s./ ha Flufenacet	Water (l/ha)	g a.s./hl Flufenacet				Total residue definition		
	(a)	(b)				(c)				(d)	(e)

Trial No./ Location/ EU zone/ Year (a)	Commodity/ Variety (a)	Date of 1.Sowing or planting 2. Harvest (b)	Application rate per treatment: g a.s./ ha Flufenacet	Application rate per treatment: Water (l/ha)	Application rate per treatment: g a.s./hl Flufenacet	Dates of treatment or no. of treatments and last date (c)	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg): Total residue definition	PHI (days) (d)	Details on trial (e)
Trial B8274 AV1 France Southern Zone	Winter wheat Miradoux	22/10/2018 01/07/2019	124.4	311	40	07/02/2019	BBCH 14	Grain Straw	0.02 <0.05	DAA 144	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8274 BA1 Italy Southern Zone	Winter wheat Quadrato	12/12/2018 03/07/2019	124.4	311	40	21/02/2019	BBCH 14	Grain Straw	<0.003 n.d. <0.05	DAA 132	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8274 EF1 France Southern Zone	Winter wheat Oregrain	26/10/2018 09/07/2019	131.6	329	40	10/12/2018	BBCH 14	Grain Straw	0.02 <0.05	DAA 211	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8274 GR1 Greece Southern Zone	Winter wheat Levante	28/12/2018 08/07/2019	132	330	40	18/03/2019	BBCH 14	Grain Straw	0.01 <0.05	DAA 112	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8274 TL1 France Southern Zone	Winter wheat Venezio	25/10/2018 04/07/2019	125.2	313	40	04/02/2019	BBCH 14	Grain Straw	0.02 <0.05	DAA 150	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8274 ES1 Spain Southern Zone	Winter wheat Bonifacio	20/12/2018 11/07/2019	125.6	314	40	18/03/2019	BBCH 14	Grain Straw	0.02 0.06	DAA 115	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8274 GR2 Greece Southern Zone	Winter wheat Marco Aurelio	25/11/2018 21/06/2019	124.0	310	40	15/02/2019	BBCH 14	Grain Straw	<0.003 n.d. <0.015 n.d.	DAA 126	residues of flufenacet according to the analytical method BAG 01100/M002 as validated in S20-09167
Trial B8274 IT1	Winter wheat	20/10/2018	125.2	313	40	26/11/2018	BBCH 14	Grain	0.01	DAA	residues of flufenacet

Trial No./ Location/ EU zone/ Year	Commodity/ Variety	Date of 1.Sowing or planting 2. Harvest	Application rate per treatment			Dates of treatment or no. of treatments and last date	Growth stage at last treatment or date	Portion analyzed	Residues (mg/kg)	PHI (days)	Details on trial
			g a.s./ ha Flufenacet	Water (l/ha)	g a.s./hl Flufenacet				Total residue definition		
	(a)	(b)				(c)				(d)	(e)
Italy Southern Zone	Rebelde	27/06/2019						Straw	<0.05	213	according to the analytical method BAG 01100/M002 as validated in S20-09167

(a) According to CODEX Classification / Guide
(b) Only if relevant
(c) Year must be indicated
(d) Days after last application (Label pre-harvest interval, PHI, underline)
(e) Remarks may include: Climatic conditions; Reference to analytical method and information which metabolites are included

A 2.2.3 Magnitude of residues in livestock

No new studies are submitted.

A 2.2.4 Magnitude of residues in processed commodities (Industrial Processing and/or Household Preparation)

No new studies are submitted.

A 2.2.5 Magnitude of residues in representative succeeding crops

No new studies are submitted.

A 2.2.6 Other/Special Studies

No new studies are submitted.

Appendix 3 Pesticide Residue Intake Model (PRIMo)

A 3.1 TMDI calculations

European Food Safety Authority
EFSA PRIMo revision 3.1; 2019/03/19

Aclonifen (F)

LOQs (mg/kg) range from:	0.01	to:	0.05
Toxicological reference values			
ADI (mg/kg bw/day):	0.07	ARfD (mg/kg bw):	not necessary
Source of ADI:	EFSA	Source of ARfD:	EFSA
Year of evaluation:	2008	Year of evaluation:	2008

Input values
Details - chronic risk assessment
Supplementary results - chronic risk assessment
Details - acute risk assessment/children
Details - acute risk assessment/adults

Comments:

Normal mode

Chronic risk assessment: JMPR methodology (IEDI/TMDI)

No of diets exceeding the ADI : ---

	Calculated exposure (% of ADI)	MS Diet	Expsoure (µg/kg bw per day)	Highest contributor to MS diet (in % of ADI)	Commodity / group of commodities	2nd contributor to MS diet (in % of ADI)	Commodity / group of commodities	3rd contributor to MS diet (in % of ADI)	Commodity / group of commodities	Exposure resulting from: MRLs set at the LOQ (in % of ADI)	Exposure resulting from: commodities not under assessment (in % of ADI)
TMDI/NEDI/IEDI calculation (based on average food consumption)	2%	NL toddler	1.44	0.9%	Milk: Cattle	0.2%	Apples	0.1%	Potatoes	2%	
	1%	DE child	0.85	0.3%	Milk: Cattle	0.2%	Apples	0.1%	Carrots	0.9%	
	1%	UK infant	0.78	0.6%	Milk: Cattle	0.2%	Carrots	0.1%	Potatoes	0.9%	
	1%	NL child	0.76	0.3%	Milk: Cattle	0.1%	Sugar beet roots	0.1%	Potatoes	1.0%	
	1%	FR toddler 2 3 yr	0.73	0.4%	Milk: Cattle	0.1%	Beans (with pods)	0.1%	Carrots	0.8%	
	1.0%	FR child 3 15 yr	0.69	0.3%	Milk: Cattle	0.1%	Wheat	0.1%	Carrots	0.8%	
	0.9%	GEMS/Food G11	0.62	0.1%	Celeriacs/turnip rooted celeries	0.1%	Potatoes	0.1%	Milk: Cattle	0.6%	
	0.8%	UK toddler	0.58	0.3%	Milk: Cattle	0.1%	Potatoes	0.1%	Beans	0.7%	
	0.8%	GEMS/Food G15	0.55	0.1%	Potatoes	0.1%	Milk: Cattle	0.1%	Wheat	0.6%	
	0.8%	DK child	0.55	0.2%	Milk: Cattle	0.2%	Carrots	0.1%	Rye	0.6%	
	0.8%	GEMS/Food G07	0.54	0.1%	Potatoes	0.1%	Milk: Cattle	0.1%	Wheat	0.6%	
	0.8%	IE adult	0.53	0.1%	Potatoes	0.1%	Milk: Cattle	0.1%	Celeriacs/turnip rooted celeries	0.5%	
	0.7%	SE general	0.52	0.2%	Milk: Cattle	0.1%	Potatoes	0.1%	Carrots	0.6%	
	0.7%	GEMS/Food G08	0.52	0.1%	Potatoes	0.1%	Milk: Cattle	0.1%	Wheat	0.6%	
	0.7%	GEMS/Food G06	0.49	0.1%	Wheat	0.1%	Potatoes	0.1%	Tomatoes	0.6%	
	0.7%	GEMS/Food G10	0.49	0.1%	Potatoes	0.1%	Milk: Cattle	0.1%	Wheat	0.6%	
	0.7%	RO general	0.48	0.2%	Milk: Cattle	0.1%	Potatoes	0.1%	Wheat	0.6%	
	0.7%	ES child	0.46	0.2%	Milk: Cattle	0.1%	Wheat	0.1%	Potatoes	0.6%	
	0.6%	FR infant	0.44	0.2%	Milk: Cattle	0.1%	Carrots	0.1%	Beans (with pods)	0.4%	
	0.6%	DE women 14-50 yr	0.44	0.2%	Milk: Cattle	0.1%	Sugar beet roots	0.0%	Apples	0.5%	
	0.6%	DE general	0.43	0.2%	Milk: Cattle	0.1%	Sugar beet roots	0.0%	Potatoes	0.5%	
	0.6%	FI adult	0.39	0.4%	Coffee beans	0.0%	Carrots	0.0%	Potatoes	0.5%	
	0.5%	NL general	0.37	0.1%	Milk: Cattle	0.1%	Potatoes	0.0%	Sugar beet roots	0.5%	
	0.5%	PT general	0.34	0.2%	Potatoes	0.1%	Carrots	0.1%	Wheat	0.4%	
	0.4%	FI 3 yr	0.30	0.1%	Potatoes	0.1%	Carrots	0.0%	Bananas	0.3%	
	0.4%	FR adult	0.29	0.1%	Milk: Cattle	0.0%	Wine grapes	0.0%	Wheat	0.3%	
	0.4%	ES adult	0.26	0.1%	Milk: Cattle	0.0%	Wheat	0.0%	Beans (with pods)	0.3%	
	0.3%	FI 6 yr	0.24	0.1%	Potatoes	0.1%	Carrots	0.0%	Cocoa beans	0.3%	
	0.3%	DK adult	0.22	0.1%	Milk: Cattle	0.1%	Carrots	0.0%	Potatoes	0.2%	
	0.3%	IT toddler	0.22	0.1%	Wheat	0.0%	Potatoes	0.0%	Other cereals	0.2%	
	0.3%	UK vegetarian	0.22	0.0%	Milk: Cattle	0.0%	Beans	0.0%	Potatoes	0.2%	
	0.3%	LT adult	0.21	0.1%	Potatoes	0.1%	Milk: Cattle	0.0%	Apples	0.3%	
	0.3%	UK adult	0.19	0.0%	Milk: Cattle	0.0%	Potatoes	0.0%	Beans	0.2%	
	0.3%	PL general	0.18	0.1%	Potatoes	0.0%	Carrots	0.0%	Apples	0.2%	
	0.3%	IT adult	0.18	0.1%	Wheat	0.0%	Beans (with pods)	0.0%	Potatoes	0.2%	
	0.1%	IE child	0.10	0.1%	Milk: Cattle	0.0%	Carrots	0.0%	Potatoes	0.1%	

Conclusion:
The estimated long-term dietary intake (TMDI/NEDI/IEDI) was below the ADI.
The long-term intake of residues of Aclonifen (F) is unlikely to present a public health concern.

European Food Safety Authority
EFSA PRIMo revision 3.1; 2019/03/19

Flufenacet

LOQs (mg/kg) range from:	0.01	to:	0.05
Toxicological reference values			
ADI (mg/kg bw/day):	0.005	ARfD (mg/kg bw):	0.017
Source of ADI:	EU Peer	Source of ARfD:	EU Peer Review 2003
Year of evaluation:		Year of evaluation:	

Input values | Details - chronic risk assessment | Supplementary results - chronic risk assessment | Details - acute risk assessment/children | Details - acute risk assessment/adults

Comments:

Normal mode

Chronic risk assessment: JMPR methodology (IEDI/TMDI)

No of diets exceeding the ADI : ---

TMDI/NEDI/IEDI calculation (based on average food consumption)	Calculated exposure (% of ADI)	MS Diet	Expsoure (µg/kg bw per day)	Highest contributor to MS diet (in % of ADI)	Commodity / group of commodities	2nd contributor to MS diet (in % of ADI)	Commodity / group of commodities	3rd contributor to MS diet (in % of ADI)	Commodity / group of commodities	Exposure resulting from: MRLs set at the LOQ (in % of ADI)	Exposure resulting from: commodities not under assessment (in % of ADI)
	88%	NL toddler	4.41	13%	Potatoes	12%	Milk: Cattle	11%	Apples	67%	
	57%	NL child	2.83	10%	Potatoes	8%	Sugar beet roots	8%	Wheat	38%	
	55%	DE child	2.73	12%	Apples	8%	Wheat	8%	Potatoes	38%	
	47%	GEMS/Food G06	2.33	14%	Wheat	6%	Potatoes	4%	Tomatoes	26%	
	45%	GEMS/Food G11	2.27	12%	Potatoes	7%	Wheat	4%	Soyabeans	25%	
	45%	GEMS/Food G08	2.24	12%	Potatoes	8%	Wheat	2%	Soyabeans	23%	
	44%	GEMS/Food G07	2.19	11%	Potatoes	8%	Wheat	2%	Soyabeans	23%	
	43%	GEMS/Food G15	2.16	11%	Potatoes	9%	Wheat	2%	Soyabeans	22%	
	43%	FR child 3 15 yr	2.13	9%	Wheat	5%	Milk: Cattle	5%	Potatoes	29%	
	42%	GEMS/Food G10	2.08	9%	Potatoes	8%	Wheat	3%	Soyabeans	24%	
	41%	RO general	2.05	11%	Potatoes	10%	Wheat	2%	Milk: Cattle	20%	
	40%	DK child	2.00	9%	Wheat	7%	Potatoes	6%	Rye	24%	
	39%	SE general	1.95	13%	Potatoes	6%	Wheat	4%	Bovine: Muscle/meat	20%	
	39%	UK toddler	1.95	10%	Potatoes	8%	Wheat	4%	Milk: Cattle	21%	
	39%	UK infant	1.94	10%	Potatoes	8%	Milk: Cattle	5%	Wheat	24%	
	37%	FR toddler 2 3 yr	1.87	6%	Wheat	6%	Milk: Cattle	6%	Potatoes	26%	
	36%	IE adult	1.78	7%	Potatoes	5%	Wheat	4%	Sweet potatoes	24%	
	35%	PT general	1.77	16%	Potatoes	8%	Wheat	2%	Wine grapes	12%	
	33%	ES child	1.67	9%	Wheat	6%	Potatoes	2%	Milk: Cattle	19%	
	29%	DE women 14-50 yr	1.45	5%	Sugar beet roots	4%	Wheat	3%	Potatoes	21%	
	29%	NL general	1.43	7%	Potatoes	4%	Wheat	3%	Sugar beet roots	17%	
	28%	DE general	1.42	4%	Sugar beet roots	4%	Wheat	4%	Potatoes	20%	
	27%	FI 3 yr	1.37	14%	Potatoes	2%	Wheat	1%	Bananas	11%	
	25%	IT toddler	1.24	13%	Wheat	3%	Potatoes	2%	Other cereals	9%	
	22%	FI 6 yr	1.10	12%	Potatoes	2%	Wheat	0.8%	Bananas	8%	
	21%	ES adult	1.04	5%	Wheat	3%	Potatoes	1%	Oranges	12%	
	20%	LT adult	1.02	10%	Potatoes	2%	Wheat	2%	Apples	9%	
	20%	FR infant	1.01	6%	Potatoes	3%	Milk: Cattle	2%	Apples	13%	
	19%	FR adult	0.97	4%	Wheat	2%	Wine grapes	2%	Potatoes	13%	
	17%	IT adult	0.87	8%	Wheat	2%	Potatoes	1%	Tomatoes	7%	
	17%	UK vegetarian	0.83	4%	Potatoes	4%	Wheat	0.9%	Oranges	8%	
	17%	PL general	0.83	10%	Potatoes	2%	Apples	0.9%	Tomatoes	6%	
	16%	DK adult	0.79	4%	Potatoes	2%	Wheat	1%	Milk: Cattle	10%	
	16%	UK adult	0.78	4%	Potatoes	3%	Wheat	1%	Wine grapes	8%	
	15%	FI adult	0.77	6%	Coffee beans	4%	Potatoes	0.7%	Rye	11%	
	7%	IE child	0.37	2%	Wheat	2%	Potatoes	0.7%	Milk: Cattle	3%	

Conclusion:
The estimated long-term dietary intake (TMDI/NEDI/IEDI) was below the ADI.
The long-term intake of residues of Flufenacet is unlikely to present a public health concern.

European Food Safety Authority

EFSA PRIMo revision 3.1; 2019/03/19

Na-TFA

LOQs (mg/kg) range from: to:

Toxicological reference values

ADI (mg/kg bw/day):	**0.05**	ARfD (mg/kg bw):	**0.75**
Source of ADI:	**RAR**	Source of ARfD:	**RAR Flufenacet 2017**
Year of evaluation:		Year of evaluation:	

Input values

Details - chronic risk assessment | Supplementary results - chronic risk assessment

Details - acute risk assessment/children | Details - acute risk assessment/adults

Comments:

Refined calculation mode

Chronic risk assessment: JMPR methodology (IEDI/TMDI)

No of diets exceeding the ADI : ---

	Calculated exposure (% of ADI)	MS Diet	Expsoure (µg/kg bw per day)	Highest contributor to MS diet (in % of ADI)	Commodity / group of commodities	2nd contributor to MS diet (in % of ADI)	Commodity / group of commodities	3rd contributor to MS diet (in % of ADI)	Commodity / group of commodities	Exposure resulting from MRLs set at the LOQ (in % of ADI)	Exposure resulting from commodities not under assessment (in % of ADI)
TMDI/NEDI/IEDI calculation (based on average food consumption)	13%	NL toddler	6.71	9%	Milk: Cattle	3%	Wheat	0.3%	Rye		13%
	11%	DK child	5.33	4%	Rye	3%	Wheat	2%	Milk: Cattle		11%
	9%	UK infant	4.29	6%	Milk: Cattle	2%	Wheat	0.3%	Bovine: Muscle/meat		9%
	8%	FR child 3 15 yr	3.96	4%	Milk: Cattle	3%	Wheat	0.3%	Bovine: Muscle/meat		8%
	8%	NL child	3.84	4%	Milk: Cattle	3%	Wheat	0.2%	Bovine: Muscle/meat		8%
	8%	FR toddler 2 3 yr	3.77	5%	Milk: Cattle	2%	Wheat	0.3%	Bovine: Muscle/meat		8%
	7%	DE child	3.70	3%	Wheat	3%	Milk: Cattle	0.6%	Rye		7%
	7%	UK toddler	3.33	3%	Milk: Cattle	3%	Wheat	0.3%	Bovine: Muscle/meat		7%
	6%	ES child	3.12	3%	Wheat	2%	Milk: Cattle	0.4%	Poultry: Muscle/meat		6%
	6%	GEMS/Food G06	3.11	5%	Wheat	0.4%	Milk: Cattle	0.2%	Poultry: Muscle/meat		6%
	6%	IT toddler	3.10	5%	Wheat	1%	Other cereals	0.0%	Barley		6%
	6%	RO general	3.07	4%	Wheat	2%	Milk: Cattle	0.2%	Poultry: Muscle/meat		6%
	6%	GEMS/Food G15	3.02	3%	Wheat	1%	Milk: Cattle	0.6%	Barley		6%
	6%	GEMS/Food G08	2.95	3%	Wheat	0.9%	Milk: Cattle	0.7%	Barley		6%
	6%	GEMS/Food G07	2.81	3%	Wheat	1.0%	Milk: Cattle	0.5%	Barley		6%
	6%	SE general	2.79	2%	Wheat	2%	Milk: Cattle	1%	Bovine: Muscle/meat		6%
	5%	GEMS/Food G11	2.63	3%	Wheat	1%	Milk: Cattle	0.6%	Barley		5%
	5%	GEMS/Food G10	2.62	3%	Wheat	0.8%	Milk: Cattle	0.4%	Barley		5%
	5%	DE general	2.30	2%	Milk: Cattle	1%	Wheat	0.4%	Rye		5%
	4%	DE women 14-50 yr	2.22	2%	Milk: Cattle	2%	Wheat	0.4%	Rye		4%
	4%	IT adult	1.84	3%	Wheat	0.5%	Other cereals	0.0%	Barley		4%
	4%	NL general	1.77	1%	Wheat	1%	Milk: Cattle	0.2%	Barley		4%
	3%	ES adult	1.70	2%	Wheat	0.8%	Milk: Cattle	0.4%	Barley		3%
	3%	FR infant	1.69	3%	Milk: Cattle	0.6%	Wheat	0.1%	Bovine: Muscle/meat		3%
	3%	PT general	1.56	3%	Wheat	0.1%	Rye	0.0%	Barley		3%
	3%	IE adult	1.47	2%	Wheat	0.7%	Milk: Cattle	0.1%	Oat		3%
	3%	FR adult	1.38	2%	Wheat	0.7%	Milk: Cattle	0.1%	Bovine: Muscle/meat		3%
	3%	LT adult	1.34	0.8%	Rye	0.8%	Wheat	0.6%	Milk: Cattle		3%
	2%	DK adult	1.22	0.9%	Wheat	0.8%	Milk: Cattle	0.4%	Rye		2%
	2%	UK vegetarian	1.07	2%	Wheat	0.5%	Milk: Cattle	0.0%	Oat		2%
	2%	UK adult	1.03	1%	Wheat	0.5%	Milk: Cattle	0.2%	Bovine: Muscle/meat		2%
	2%	FI 3 yr	0.95	0.9%	Wheat	0.5%	Rye	0.4%	Oat		2%
	2%	IE child	0.77	0.9%	Wheat	0.6%	Milk: Cattle	0.0%	Poultry: Muscle/meat		2%
	1%	FI 6 yr	0.75	0.7%	Wheat	0.5%	Rye	0.2%	Oat		1%
	0.9%	FI adult	0.45	0.5%	Rye	0.2%	Wheat	0.1%	Oat		0.9%
		Column7			FRUIT AND TREE NUTS		FRUIT AND TREE NUTS				

Conclusion:
The estimated long-term dietary intake (TMDI/NEDI/IEDI) was below the ADI.
The long-term intake of residues of Na-TFA is unlikely to present a public health concern.

A 3.2 IEDI calculations

Not necessary

A 3.3 IESTI calculations - Flufenacet

Acute risk assessment /children | **Acute risk assessment / adults / general population**

Details - acute risk assessment /children | Details - acute risk assessment/adults

The acute risk assessment is based on the ARfD.
The calculation is based on the large portion of the most critical consumer group.

Show results for all crops

Unprocessed commodities

Results for children
No. of commodities for which ARfD/ADI is exceeded (IESTI): ---

IESTI

Highest % of ARfD/ADI	Commodities	MRL / input for RA (mg/kg)	Exposure (µg/kg bw)
9%	Wheat	0.11 / 0.11	1.6
7%	Milk: Cattle	0.01 / 0.01	1.2
5%	Poultry: Muscle/meat	0.05 / 0.05	0.85
4%	Rye	0.11 / 0.11	0.70
4%	Eggs: Chicken	0.05 / 0.05	0.62
4%	Barley	0.11 / 0.11	0.62
4%	Swine: Muscle/meat	0.05 / 0.05	0.61
2%	Bovine: Edible offals (other	0.05 / 0.05	0.36
2%	Bovine: Muscle/meat	0.05 / 0.05	0.36
2%	Other farmed animals:	0.05 / 0.05	0.35
2%	Equine: Muscle/meat	0.05 / 0.05	0.30
2%	Sheep: Muscle/meat	0.05 / 0.05	0.27
1%	Milk: Goat	0.01 / 0.01	0.24
1%	Bovine: Kidney	0.05 / 0.05	0.19
0.9%	Bovine: Liver	0.02 / 0.02	0.16

Expand/collapse list

Total number of commodities exceeding the ARfD/ADI in children and adult diets (IESTI calculation)

Results for adults
No. of commodities for which ARfD/ADI is exceeded (IESTI): ---

IESTI

Highest % of ARfD/ADI	Commodities	MRL / input for RA (mg/kg)	Exposure (µg/kg bw)
5%	Wheat	0.11 / 0.11	0.92
3%	Poultry: Muscle	0.05 / 0.05	0.59
3%	Rye	0.11 / 0.11	0.53
3%	Barley	0.11 / 0.11	0.53
2%	Milk: Cattle	0.01 / 0.01	0.39
2%	Bovine: Muscle	0.05 / 0.05	0.28
2%	Other farmed animals:	0.05 / 0.05	0.28
1%	Swine: Muscle/meat	0.05 / 0.05	0.24
1%	Equine: Muscle/meat	0.05 / 0.05	0.24
1%	Sheep: Muscle/meat	0.05 / 0.05	0.24
1%	Eggs: Chicken	0.05 / 0.05	0.21
1%	Milk: Goat	0.01 / 0.01	0.18
1.0%	Bovine: Edible offals (other	0.05 / 0.05	0.17
1.0%	Swine: Other products	0.05 / 0.05	0.16
0.9%	Milk: Sheep	0.01 / 0.01	0.15

Processed commodities

Results for children
No of processed commodities for which ARfD/ADI is exceeded (IESTI): ---

IESTI

Highest % of ARfD/ADI	Processed commodities	MRL / input for RA (mg/kg)	Exposure (µg/kg bw)
8%	Wheat / milling (flour)	0.11 / 0.11	1.3
4%	Wheat / milling (wholemeal)-l	0.11 / 0.11	0.61
2%	Rye / boiled	0.11 / 0.11	0.40
2%	Oat / boiled	0.11 / 0.11	0.40
2%	Barley / cooked	0.11 / 0.11	0.40
2%	Rye / milling (wholemeal)-bal	0.11 / 0.11	0.39
2%	Oat / milling (flakes)	0.11 / 0.11	0.33
1%	Barley / milling (flour)	0.11 / 0.11	0.20
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!

Expand/collapse list

Results for adults
No of processed commodities for which ARfD/ADI is exceeded (IESTI): ---

IESTI

Highest % of ARfD/ADI	Processed commodities	MRL / input for RA (mg/kg)	Exposure (µg/kg bw)
5%	Barley / beer	0.11 / 0.02	0.79
3%	Wheat / bread/pizza	0.11 / 0.11	0.48
2%	Wheat / pasta	0.11 / 0.11	0.42
2%	Wheat / bread (wholemeal)	0.11 / 0.11	0.38
1.0%	Oat / boiled	0.11 / 0.11	0.17
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!

Conclusion:
No exceedance of the toxicological reference value was identified for any unprocessed commodity.
A short term intake of residues of Flufenacet is unlikely to present a public health risk.
For processed commodities, no exceedance of the ARfD/ADI was identified.

IESTI calculations – TFA-Na

Acute risk assessment /children | **Acute risk assessment / adults / general population**

Details - acute risk assessment /children | Details - acute risk assessment/adults

The acute risk assessment is based on the ARfD.
The calculation is based on the large portion of the most critical consumer group.

Show results for all crops

Unprocessed commodities

Results for children
No. of commodities for which ARfD/ADI is exceeded (IESTI): ---

IESTI

Highest % of ARfD/ADI	Commodities	MRL / input for RA (mg/kg)	Exposure (µg/kg bw)
1%	Milk: Cattle	0 / 0.08	9.6
0.7%	Wheat	0 / 0.38	5.5
0.3%	Rye	0 / 0.38	2.4
0.3%	Barley	0 / 0.38	2.1
0.06%	Oat	0 / 0.38	0.42

Expand/collapse list

Results for adults
No. of commodities for which ARfD/ADI is exceeded (IESTI): ---

IESTI

Highest % of ARfD/ADI	Commodities	MRL / input for RA (mg/kg)	Exposure (µg/kg bw)
0.4%	Wheat	0 / 0.38	3.2
0.4%	Milk: Cattle	0 / 0.08	3.0
0.2%	Rye	0 / 0.38	1.8
0.2%	Barley	0 / 0.38	1.8
0.03%	Oat	0 / 0.38	0.24

Total number of commodities exceeding the ARfD/ADI in children and adult diets (IESTI calculation)

Processed commodities

Results for children
No of processed commodities for which ARfD/ADI is exceeded (IESTI): ---

IESTI

Highest % of ARfD/ADI	Processed commodities	MRL / input for RA (mg/kg)	Exposure (µg/kg bw)
0.6%	Wheat / milling (flour)	0 / 0.38	4.6
0.3%	Wheat / milling (wholemeal)-l	0 / 0.38	2.1
0.2%	Rye / boiled	0 / 0.38	1.4
0.2%	Oat / boiled	0 / 0.38	1.4
0.2%	Barley / cooked	0 / 0.38	1.4
0.2%	Rye / milling (wholemeal)-bal	0 / 0.38	1.3
0.2%	Oat / milling (flakes)	0 / 0.38	1.1
0.1%	Barley / milling (flour)	0 / 0.38	0.69
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!

Expand/collapse list

Results for adults
No of processed commodities for which ARfD/ADI is exceeded (IESTI): ---

IESTI

Highest % of ARfD/ADI	Processed commodities	MRL / input for RA (mg/kg)	Exposure (µg/kg bw)
0.4%	Barley / beer	0 / 0.08	2.7
0.2%	Wheat / bread/pizza	0 / 0.38	1.7
0.2%	Wheat / pasta	0 / 0.38	1.4
0.2%	Wheat / bread (wholemeal)	0 / 0.38	1.3
0.08%	Oat / boiled	0 / 0.38	0.58
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!
#GETAL!	#GETAL!	#GETAL!	#GETAL!

Conclusion:
No exceedance of the toxicological reference value was identified for any unprocessed commodity.
A short term intake of residues of Na-TFA is unlikely to present a public health risk.
For processed commodities, no exceedance of the ARfD/ADI was identified.

A 3.4 Dietary burden calculations

Animal burden calculation — Aclonifen

According to: "OECD Guidance Document, Series on testing and assessment No 64 and Series on pesticides No 32" and "OECD Guidance Document on Residues in livestock, Series on Pesticides No 73"

Maximum Intake	Cattle						Sheep					
	Beef	500 kg / 12 kg		Dairy	650 kg / 25 kg		Ram/Ewe	75 kg / 2.5 kg		Lamb	40 kg / 1.7 kg	
(mg/kg bw/d)	0.003	mg/kg bw/d	%	0.004	mg/kg bw/d	%	0.004	mg/kg bw/d	%	0.003	mg/kg bw/d	%
Contributor 1	Potato	process waste	40	Potato	process waste	30	Potato	process waste	40	Potato	culls	20
Contributor 2	Potato	culls	30	Potato	culls	30	Potato	culls	30	Wheat	milled bypdts	50
Contributor 3	Barley	straw	30	Corn, field	forage/silage	40	Rye	straw	30	Rye	straw	30
Contributor 4			0			0			0			0
Median intake	0.0027	mg/kg bw/d		0.0038	mg/kg bw/d		0.0034	mg/kg bw/d		0.0028	mg/kg bw/d	

Maximum Intake	Swine					
	Breeding	260 kg / 6 kg		Finishing	100 kg / 3 kg	
(mg/kg bw/d)	0.002	mg/kg bw/d	%	0.003	mg/kg bw/d	%
Contributor 1	Potato	culls	50	Potato	culls	50
Contributor 2	Wheat	milled bypdts	50	Wheat	milled bypdts	50
Contributor 3			0			0
Contributor 4			0			
Median intake	0.002	mg/kg bw/d		0.003	mg/kg bw/d	

Intakes >0.004 mg/kg bw/d are highlighted

Maximum Intake	Poultry								
	Broiler	1.7 kg / 0.12 kg		Layer	1.9 kg / 0.13 kg		Turkey	7 kg / 0.5 kg	
(mg/kg bw/d)	0.002	mg/kg bw/d	%	0.003	mg/kg bw/d	%	0.003	mg/kg bw/d	%
Contributor 1	Potato	culls	10	Potato	culls	10	Potato	culls	20
Contributor 2	Wheat	milled bypdts	20	Wheat	milled bypdts	20	Wheat	milled bypdts	20
Contributor 3	Barley	grain	70	Wheat	straw	10	Rye	grain	60
Contributor 4				Barley	grain	60			
Median intake	0.002	mg/kg bw		0.003	mg/kg bw		0.003	mg/kg bw	

Intakes expressed on the dry mater basis (mg/kg DM)

mg/kg DM	Cattle		Sheep		Swine	
	Beef	Dairy	Ram/Ewe	Lamb	Breeding	Finishing
Maximum	0.11	0.10	0.1	0.08	0.09	0.09
Median	0.11	0.10	0.10	0.07	0.09	0.09

	Poultry		
	Broiler	Layer	Turkey
Maximum	0.03	0.04	0.04
Median	0.03	0.04	0.04

Intake >0.1 mg/kg DM in red characters

Animal burden calculation

Flufenacet

According to: "OECD Guidance Document, Series on testing and assessment No 64 and Series on pesticides No 32" and "OECD Guidance Document on Residues in livestock, Series on Pesticides No 73"

Maximum Intake	Cattle						Sheep					
	Beef 500 kg / 12 kg			**Dairy** 650 kg / 25 kg			**Ram/Ewe** 75 kg / 2.5 kg			**Lamb** 40 kg / 1.7 kg		
(mg/kg bw/d)	**0.085**	mg/kg bw/d	%	**0.104**	mg/kg bw/d	%	**0.118**	mg/kg bw/d	%	**0.079**	mg/kg bw/d	%
Contributor 1	Potato	process wast	40	Potato	process wast	30	Potato	process wast	40	Potato	process wast	20
Contributor 2	Potato	culls	30	Potato	culls	30	Potato	culls	30	Potato	culls	20
Contributor 3	Barley	straw	30	Barley	straw	30	Rye	straw	30	Barley	straw	60
Contributor 4			0	Barley	grain	10			0			0
Median intake	0.0826	mg/kg bw/d		0.1006	mg/kg bw/d		0.1147	mg/kg bw/d		0.0758	mg/kg bw/d	

Maximum Intake	Swine					
	Breeding 260 kg / 6 kg			**Finishing** 100 kg / 3 kg		
(mg/kg bw/d)	**0.045**	mg/kg bw/d	%	**0.022**	mg/kg bw/d	%
Contributor 1	Potato	process wast	20	Potato	dried pulp	20
Contributor 2	Potato	culls	50	Potato	culls	50
Contributor 3	Barley	grain	30	Barley	grain	30
Contributor 4						
Median intake	0.042	mg/kg bw/d		0.017	mg/kg bw/d	

Intakes >0.004 mg/kg bw/d are highlighted

Maximum Intake	Poultry								
	Broiler 1.7 kg / 0.12 kg			**Layer** 1.9 kg / 0.13 kg			**Turkey** 7 kg / 0.5 kg		
(mg/kg bw/d)	**0.037**	mg/kg bw/d	%	**0.029**	mg/kg bw/d	%	**0.016**	mg/kg bw/d	%
Contributor 1	Potato	dried pulp	20	Potato	dried pulp	15	Potato	culls	20
Contributor 2	Potato	culls	10	Potato	culls	10	Wheat	milled bypdts	20
Contributor 3	Barley	grain	70	Wheat	straw	10	Rye	grain	60
Contributor 4				Barley	grain	65			
Median intake	0.035	mg/kg bw		0.027	mg/kg bw		0.012	mg/kg bw	

Intakes expressed on the dry mater basis (mg/kg DM)

mg/kg DM	Cattle		Sheep		Swine	
	Beef	Dairy	Ram/Ewe	Lamb	Breeding	Finishing
Maximum	**3.54**	**2.71**	**3.5**	**1.85**	**1.96**	**0.72**
Median	3.44	2.61	3.44	1.78	1.81	0.57

	Poultry		
	Broiler	Layer	Turkey
Maximum	**0.53**	**0.43**	**0.22**
Median	0.50	0.40	0.16

Intake >0.1 mg/kg DM in red characters

Appendix 4 Additional information provided by the applicant

None